



COMMUNITY ACTION PLAN APPENDIX

6/3/2008

Table of Contents

CLIMATE ACTION	3
TRANSPORTATION	4
ENERGY EFFICIENCY	14
RENEWABLE ENERGY	23
EDUCATION	26
WASTE	28
OTHER CARBON REDUCTION STRATEGIES	31
ENVIRONMENT	33
WATER QUALITY	34
NATURAL RESOURCES	37
LAND USE	39
AIR	40
ECONOMY	42
LOCAL ECONOMIC DEVELOPMENT	43
GREEN JOBS	46
NEIGHBORHOODS	48
CHILDREN, HEALTH, & SAFETY	49
EDUCATION, ARTS, & COMMUNITY	51

CLIMATE ACTION



TRANSPORTATION

GOAL: EMISSIONS REDUCTION OF THE CITY GOVERNMENT TRANSPORTATION SECTOR

Strategy A: Lower employee reliance on fossil-fueled automobiles

Action items

- **Employee parking opt-out program**

Description: Free parking represents one of the largest hidden subsidies to automobile use. Ninety-five percent of all commuters who drive to work in the U.S. receive free parking. One study values these tax-free employee parking benefits at \$36 billion annually. Because employers cover the cost of their employee parking or pass it along-term to their clients and customers, most automobile commuters are not conscious of the true cost of parking and therefore choose to drive to work. Parking cash out is a powerful mechanism for reducing single occupancy automobile commuting and increasing commuter choice. In essence, parking cash out is an employee transportation benefit that offers workers the option of giving up their employer-provided parking space in exchange for its equivalent monetary value. For example, if an employer currently pays \$50 per month to lease a parking space, under a cash-out program they would also offer the choice of \$50 cash to employees who choose to give up their parking space. Because offering such a choice removes a strong monetary incentive to drive, parking cash out can result in substantial reductions in automobile commuting.

Proposed Actions: Implement employee cash-out program for parking.

CO₂e Reductions: 11 metric tons CO₂e, 0.34% towards 2012 reduction goal (assumes 25 employees participate)

Goals: Improved air quality, lower GHG emissions, lower costs, lower traffic

Timeframe: Short-term

Costs: May pay for itself due to lower payments to parking company.

Department: Central Services, Human Resources

- **Create employee carpooling incentives**

Description: Sharing a car or van to get to work is much more efficient than driving to work alone. Less fuel is used per passenger and vehicle costs are spread over more than one person. Local government can set an example by implementing a ride-sharing program for its employees. It can encourage or mandate other employers to do the same. A local government can also provide low-interest or interest-free loans to businesses that are setting up vanpool programs.

Another program that will encourage carpooling and vanpooling is to offer a guaranteed ride home. Studies have shown that many employees commute by car so they can get home quickly if something comes up—such as an emergency or a call from school. Address this concern by guaranteeing employees a ride home—by taxi or company car—when needed. The expense should be minimal because experience has shown that employees rarely take advantage of this service. The benefits will be compounded since both commute trips and incidental trips employees take during the day for lunch, banking, and shopping will be reduced.

Proposed Actions: Create employee program to facilitate carpooling. Could partner with ARTMA. Incentives should be developed.

CO₂e Reductions: 6 metric tons of CO₂e, 0.17% towards 2012 reduction goal (assumes 30 employees participate)

Goals: Improved air quality, lower GHG emissions, lower Costs, lower traffic

Timeframe: Short-term

Costs: Incentives - \$1,000 buy-out

Department: Human Resources

- **Preferential employee parking**

Description: Employees who have alternative fueled vehicles could get reserved spots on the 2nd floor of the city parking garage, or spots near the exits.

Proposed Actions: Create parking incentives or advantages for people who drive alternative fueled vehicles to work—such as CNG, electric, hybrid, bio-fuels, etc.

CO₂e Reductions: 40 metric tons of CO₂e, 1.51% towards the reduction goal (assumes 15 hybrids used by employees)

Goals: lower GHG emissions, promotion of alternative fueled vehicles

Timeframe: Short-term

Department: Human Resources

- **Telecommuting program**

Description: The technology for telecommuting exists to allow multiple users to share a single “telecommuting “ server but is under utilized.

Proposed Actions: Ensure that departments have telecommuting controls, policies and procedures, in place. Encourage departments to let employees work from home.

CO₂e Reductions: 86 metric tons of CO₂e, 6.50% towards reduction goal (5% employee participation)

Goals: Fewer employees commuting lower GHG emissions, cleaner air, less office space required.

Department: Management Information Technology, Human Resources

- **Employee bicycle program**

Description: Increasing employee access to safe and reliable bicycles may help to encourage employees to bike to work.

Proposed Actions: Partner with local bike shops to offer discounted or free bikes for employees who commit to biking to work.

Climate Action – Transportation

CO₂e Reductions: 25 metric ton of CO₂e, 0.76% towards reduction goal (assumes 20 employees participate)
Goals: Fewer employees commuting in cars, lower GHG emissions, cleaner air
Department: Human resources

Strategy B: Lower emissions from City fleet

Action Items

- **Utilize fuel-efficient, low carbon scooters**

Description: Electric vehicles will have a lower amount of emissions than fuel-based vehicles once the city purchases more renewable energy to supply its energy. In addition, electric vehicles have lower maintenance and operating Costs than gasoline vehicles. Scooters will also help to lower the amount of traffic congestion caused by larger automobiles.

Proposed Actions: Purchase a few electric scooters on a trial basis.

CO₂e Reductions: 13 metric tons of CO₂e, 0.39% towards 2012 reduction goal (assumes 5 employees use scooters)

Goals: Lower emissions and costs by lowering employee reliance on fossil-fuel based vehicles.

Timeframe: Short-term

Cost: Electric scooter – \$1,000 (for low end) – \$4,000 (55mph max, 75 mile range)

<http://www.thegostore.com/alleisc.html>

Department: Department of Neighborhood & Environmental Programs

- **Improve vehicle maintenance program to include energy efficiency maintenance**

Description: Keeping vehicles properly tuned (including properly functioning oxygen sensors and clean fuel injections) and tires properly inflated will allow cars to run with higher fuel efficiency.

Proposed Actions: Regularly inspect all city vehicles for energy efficiency improvements. Install sensors on tires indicating when they need more air for fuel efficiency.

CO₂e Reductions: 23 metric tons of CO₂e, 0.71% towards 2012 reduction goal (assumes 50 vehicles)

Goals: Lower fuel Cost, lower GHG emissions

Timeframe: Short-term

Cost: Tire check valves - \$20 for 4 valves

Department: Transportation Department

- **Fleet conversion to alternative fuels**

Description:

Biodiesel: Using biodiesel in municipal fleet vehicles is a simple and effective way to achieve large reductions in CO₂ emissions from fleet operations. If biodiesel made from waste cooking oil is available, the emissions reductions are increased, because fossil fuel inputs to agriculture are avoided. Garbage trucks, snowplows, fire trucks, maintenance vehicles, and transit buses are all good options for using biodiesel. There is no need to convert the vehicles, so there is no capital Cost to the switch. Biodiesel can be used by itself (called B100 for 100% biodiesel) or mixed with petroleum diesel. A popular mix is B20, 20% biodiesel with 80% petroleum diesel.

CNG: Compressed Natural Gas. Natural gas is a clean-burning alternative to gasoline or diesel for municipal and private fleet vehicles. While natural gas is a fossil fuel, it has lower carbon emissions per unit of energy than gasoline or diesel. CNG lowers fuel Costs compared to gasoline or diesel. Fleets are a good place to use CNG vehicles because they can use centralized refueling infrastructure. CNG conversions for small heavy-duty transit buses have not always been successful, and should be investigated more.

Electric/hybrid: EVs use regenerative braking to capture and reuse the energy of the vehicle's momentum in stop-and-go traffic, greatly increasing their efficiency in city driving. Neighborhood electric vehicles (NEVs) have a top speed of 25 mph, and are suitable for meter reading, parking enforcement, and small deliveries. A number of smaller companies have recently introduced electric utility pickups and delivery vans appropriate for fleet use. Some cities have created an electric bus fleet.

Hydrogen: Hydrogen can drive vehicles by being burned in an engine the same as other fuels, or it can be utilized by a fuel cell to make electricity, replacing the battery in an electric vehicle and giving a longer range. Emissions in the production of hydrogen depend on how it is produced. Hydrogen is not an energy source; it is an energy storage method. Most current hydrogen production in the US is from natural gas. Another option is to use electricity to split water into hydrogen and oxygen molecules. The electricity can derive from fossil fuels, in which case emissions will be relatively high, or from renewable sources like solar and wind.

Proposed Actions: Convert entire fleet to alternative fuels.

CO₂e Reductions: Biodiesel: 8 metric tons of CO₂e, 0.24% towards 2012 reduction goal (10,000 gallons switched over)

CNG: 14 metric tons of CO₂e, 0.44% towards 2012 reduction goal (10 vehicles switched over)

Ethanol: 6 metric tons of CO₂e, 0.18% towards 2012 reduction goal (10 vehicles)

Hydrogen & fuel cell: 1 metric ton of CO₂e, 0.02% towards 2012 reduction goal (10 vehicles)

Electric: 28 metric tons of CO₂e, 0.73% towards 2012 reduction goal (10 vehicles)

Hybrid: 33 metric tons of CO₂e, 1.01% towards 2012 reduction goal (10 vehicles)

Goals: Cleaner air, lower GHG emissions, long-term-term cost savings

Timeframe: Mid-term

Cost: How much does it Cost to convert to biodiesel? A Keene, NH representative stated that the only Costs they saw was the increase in the Cost of the fuel itself...only a few cents per gallon. There is a difference in Cost between B5 and B20. The Cost difference in switching from B5 to B20 (they purchased 40,000 gallons) was 10 cents per gallon or \$4000.

CNG conversion Cost - \$30,000 - \$100,000 per vehicle

Department: Transportation Department, Public Works Department, Central Services, Fire Department, Police Department

- **Use software & GPS to create efficient waste routes for pickup**

Climate Action – Transportation

Description: Routing software has been utilized by waste managers to determine the most efficient routes for their trucks to lower their emissions and costs. GPS can also be utilized to map vehicle routes to create more efficient routes.

Proposed Actions: Purchase software and use it to make the garbage pickup routes more efficient to lower transportation costs and emissions. Purchase GPS vehicle tracking capability to help create efficient routes.

CO₂e Reductions: 19 metric tons of CO₂e, 0.58% towards 2012 reduction goal (based off of per person savings from San Diego)

NOTE: DPW is currently working with MIT/GIS division on this task

Goals: Lower carbon emissions & transportation Costs

Cost: Routing software
GPS tracking unit - \$500 per unit

Timeframe: Short-term

Department: Public Works Department

- **Wireless Mobility Network**

Proposed Actions: Build a wireless mobility network for City "in the field" workers and operations.

CO₂e Reductions: Minimal

Goals: Lower employee travel time, lower energy consumption, lower GHG emissions, cleaner air.

Costs: Capital costs, high, operating costs, low.

Department: Management Information Technology

- **Add alternative-fueled vehicles & mounted patrols**

Description: Police cars are usually heavy cars with large engines that get poor mileage and produce a high amount of GHG emissions per vehicle. Bicycles, on the other hand, produce no emissions. In some communities, exhaust from cars and light trucks is the single biggest cause of local air pollution. Reducing the use of vehicles in government operations reduces those emissions. Studies have shown police on bicycles are more effective than police in cars. Police on bicycles are more approachable, better able to connect with the public, and to observe what is happening. Also, police on bicycles can pursue suspects in places where cars can't go.

CO₂e Reductions: 35 metric tons of CO₂e, 1.08% towards 2012 reduction goal (assumes 5 bike mounted police)

Proposed Actions: Set a goal of increasing police bike patrols or setup a system for mounted police on horseback. Purchase some new alternative fuel vehicles to determine if they can replace the fossil fuel vehicles.

Goals: Lower GHG emissions lower Cost, increased effectiveness

Timeframe: Short-term

Cost: Bike - \$300
Horse

Department: Police Department

- **Low-maintenance landscaping**

Description: No-mow areas help to create better wildlife habitats, save money by reducing fuel use, and lower emissions by using the mowers less. In addition, longer grass helps to slow storm water flow and acts as a more efficient filter to the water. No-mow areas are often located in areas that will see a large benefit from filtered and infiltrating water, such as near streams and creeks.

Proposed Actions: Leave certain approved grassy areas of the city un-mowed. Areas could either be entirely un-mowed or partially un-mowed.

CO₂e Reductions: 12 metric tons of CO₂e, 0.37% towards reduction goal (assumes 10 acres)

Goals: less fuel use, cost savings, lower GHG emissions

Timeframe: Short-term

Department: Recreation & Parks Department

- **No-idling policy for City vehicles**

Description: Idling unnecessarily uses fuel, releases greenhouse gasses into the atmosphere, and contributes to poor air quality.

Proposed Actions: Enact a policy where all City vehicles, where feasible, should shut off their car/truck engine after 1 minute rather than idling.

CO₂e Reductions: 36 metric tons of CO₂e, 1.11% towards 2012 reduction goal (assumes 30 heavy vehicles, 30 light)

Goals: Lower GHG emissions, cleaner air

Timeframe: Short-term

Department: All

- **Reduce municipal fleet**

Description: Many cities and counties have more vehicles than needed in their fleets. By analyzing how vehicles are used, Annapolis may be able to cut the size of their fleet. This would not only cut emissions but save some money.

Proposed Actions: Conduct a survey of the city fleet to determine if any vehicles can be retired.

CO₂e Reductions: 7 metric tons of CO₂e, 0.22% towards 2012 reduction goal (assumes 15,000 vehicle miles reduced)

Goals: Lower GHG emissions, cleaner air

Timeframe: Short-term

Department: All

- **Centralize vehicle maintenance**

Suggestion received from the public

Description: The police department, fire department, Transportation, and DPW currently all perform their own vehicle maintenance. It may be more efficient to have one central department maintain the vehicles to help reduce equipment and training redundancies and to help avoid any environmental problems.

Proposed Actions: Investigate housing City vehicle fleet maintenance under one department.

CO₂e Reductions: Minimal

Climate Action – Transportation

Goals: Lower maintenance Costs, improved efficiency
Costs: Possible cost associated with centralized facility
Timeframe: Short-term
Department: Central Services

- **Purchase/convert any city-owned vessels to alternative fuels**

Suggestion received from the public

Proposed Actions: Convert any city vessels to alternative fuels such as bio-diesel. Speak to water Taxi Company to do the same. Upgrade fuel system as needed.

CO₂e Reductions: Biodiesel: 8 metric tons of CO₂e, 0.24% towards 2012 reduction goal (10,000 gallons switched over)

Goals: Lower GHG emissions

Costs: Upgrade of fuel facilities (may not be necessary), higher fuel cost (depends on fuel-type and availability)

Timeframe: Mid-term

Department: Harbor Master's Office

GOAL: LOWER PUBLIC RELIANCE ON CARBON-BASED AUTOMOBILES

Strategy A: Improve & expand mass transit options

Action Items

- **Intra-inter harbor ferry systems**

Proposed Actions: Create a ferry system to get people to and from regional harbors.

CO₂e Reductions: 697 metric tons of CO₂e, 0.58% towards 2012 reduction goal (based on estimate 50mpg per person per ferry)

Goals: Lower GHG emissions, less congestion, lower reliance on automobiles

Timeframe: Long-term

Costs: Grant opportunities

Department: Harbor Master's Office

- **Study long-term-term mass transit options**

Such a study is currently underway.

Description:

Such as Light Rail:

A number of cities have implemented successful light rail programs over the past 10-20 years. These systems have increased transit ridership and spurred economic development. Light rail is a modernized version of streetcar and trolley lines that were a primary transportation mode in many cities before automobile use became widespread. Light rail attracts riders who usually do not ride traditional bus service (Bus Rapid Transit [BRT] has many of the same advantages as light rail and will attract many of these riders). The success of light rail can be greatly improved by planning for transit oriented development (TOD). Light rail requires a high residential density to attract sufficient ridership. TOD benefits transit systems by providing passengers, and increases property values around transit lines. Capturing some of this increase in property values is one option for funding transit systems. TOD produces a leverage effect that increases the environmental benefits of light rail by creating walking friendly mixed use environments, so for each trip that switches from car to transit, several more will switch to walking, or from distant destinations to newly constructed neighborhood stores and services. By carrying many people with a single vehicle, rail transit is much more efficient than personal automobiles. Reducing vehicle miles by providing more options for people to switch to riding transit reduces emissions.

Or Bus Rapid Transit:

Bus Rapid Transit (BRT) is designed to replicate many of the advantages of rail transit at a much lower capital Cost. Buses may operate in their own lanes separated from other traffic or may be on regular streets but given priority by traffic signals that detect the bus coming and hold a green light for it. This allows them to avoid congestion and move faster than automobile traffic. Pre-boarding payment, passes, or smart-card payment systems speed up boarding. BRT routes typically stop less frequently than local service. These changes allow BRT to move faster than regular bus service. Buses are often timed every few minutes during peak times. Signs at stations can offer real time data on when the next bus will arrive. Shelters are improved to offer protection from the elements. Buses are designed to be more comfortable, often low-floor models, and low-emission. One model uses a computer-guided system that can bring the door within centimeters of the platform for boarding. BRT is designed to overcome the stereotype of buses as transportation of last resort, and to attract car owners to buses because they are faster, cheaper, or easier. Because BRT is less expensive per mile than rail transit, the same transit dollars can build a more extensive network, making transit accessible to more people and displacing more automobile traffic. Also, BRT can be brought to operation more quickly than rail. By carrying many people with a single vehicle, buses are more efficient than personal automobiles. Reducing vehicle miles by making it more convenient for people to switch to riding the bus reduces emissions.

Other options should be investigated as well.

CO₂e Reductions: Light Rail: 1,004 metric tons of CO₂e, 0.85% towards 2012 reduction goal (assumes 250 daily passengers)

Bus rapid transit: 347 metric tons of CO₂e, 0.29% towards the 2012 reduction goal (assumes 100 new daily transit passengers)

Goals: Lower emissions and cleaner air through lower automobile usage in the city

Proposed Actions: Conduct a study of long-term-term mass transit options for the city, emphasizing connectivity to regional transit.

Timeframe: Short-term

Department: Transportation Department

- **Investigate creating longer bus hours on weekends and holidays**

Recommended by Transportation Department

Climate Action – Transportation

Description: Cities with late-night weekend bus hours providing residents with safe public transportation have fewer occurrences of drunk driving and violent crimes because of unsafe decisions to walk home while under the influence. Conducting a survey will allow the City of Annapolis to know about the behaviors of residents and visitors of Annapolis can be capitalized into an extended public transportation scheme.

Proposed Actions: Conduct a marketing survey to determine how many visitors to bars downtown are within the city limits. Create a shared ride taxi program if people live outside of downtown. Increase hours that the bus runs on Friday and Saturday nights, and holiday nights (St. Patrick's Day, new years, etc.)

CO₂e Reductions: 28 metric tons of CO₂e, 0.02% towards 2012 reduction goal (assumes 50 new daily riders)

Goals: Increased public transit ridership, decreased drunk driving

Timeframe: Short-term

Department: Transportation Department

- **Expand the mass-transit system to have more/better coverage**

Recommended by Transportation Department

Description: By carrying many people with a single vehicle, buses are more efficient than personal automobiles. Reducing vehicle miles by making it more convenient for people to switch to riding the bus reduces emissions. Increased transportation options benefits people who do not have access to an automobile or are unable to drive. Access to jobs, shopping, and social activities are increased.

Proposed Actions: Expand routes/service to have better coverage. This will increase ease and convenience of taking the service. For example, the Brown route runs only once an hour, this could be increased to twice an hour. Given that the city has limited funds, alternative methods of expanding services will be explored: contractual arrangements; public/private partnerships; jitneys for example

CO₂e Reductions: 28 metric tons of CO₂e, 0.02% towards 2012 reduction goal (assumes 50 new daily riders)

Goals: Lower GHG emissions, cleaner air

Timeframe: Mid-term

Department: Transportation Department

- **Shuttle to New Carrollton station multi-modal station**

Recommended by Transportation Department

Description: The state recently canceled the bus route from Annapolis to New Carrollton metro station.

Proposed Actions: Develop a partnership with Dillon bussing to provide a shuttle route to the New Carrollton Metro Station.

CO₂e Reductions: 176 metric tons of CO₂e, 0.14% towards 2012 reduction goal (assumes 150 new daily riders)

Goals: lower emissions, lower GHG emissions

Timeframe: Short-term

Department: Transportation Department

UNDERWAY NOW. SEEKING FUNDING FOR FY2010

- **Support regional transportation system**

Recommended by Transportation Department

Description: Support a regional transit initiative. Effective public transportation systems build out from an exclusive regional right of way, ideally rail. Light rail, Bus Rapid Transit (BRT), fixed route, and community bus systems act as feeder systems into that exclusive right of way. The city needs a reliable links to the regional rail hub(s).

Proposed Actions: Work with county and state organizations to create a more connected regional transit system.

CO₂e Reductions: 351 metric tons of CO₂e, 0.29% towards 2012 reduction goal (assumes 300 new daily riders)

Goals: Cleaner air, less GHG emissions

Timeframe: Long-term

Department: Transportation Department

- **Transit signal priority**

Description: Transit Signal Priority (TSP) uses software to give public transit vehicles priority at traffic signals, by extending green lights or shortening red lights. TSP can help to improve transit travel times, decrease traffic, and lower emissions.

Proposed Actions: Investigate the feasibility and effectiveness of implementing TSP in Annapolis.

CO₂e Reductions: 28 metric tons of CO₂e, 0.02% towards 2012 reduction goal (assumes 50 new daily riders)

Goals: Less GHG emissions, more efficient transit

Timeframe: Mid-term

Department: Transportation Department

- **Automated bus information kiosks**

Description: An automated information kiosk allows the public to interact with transportation data in real time. Systems such as bus ETA (estimated time of arrival) sensors will let public transportation users know how the busses are running. Public awareness leads to pressure to run services more efficiently, and more efficient services will increase public use.

Proposed Actions: To place automated bus information kiosks at high-traffic bus stops.

CO₂e Reductions: 28 metric tons of CO₂e, 0.02% towards 2012 reduction goal (assumes 50 new daily riders)

Goals: Citizen awareness, increased use of public transportation

Time Frame: Long-term

Cost: electronic sensors, energy sources (whether solar, battery, or wire cables), printed materials

- **Creation of a full transit hub within the City**

Suggestion received from the public

Description: A larger transit hub could be created someplace in the City, for example off of Taylor avenue at the Naval stadium, the Gaul's shopping center, or at the old state police barracks. A hub at the police barracks could potentially tie into the old

railroad that starts at the end of Taylor and heads to the Severn River. This could open up the possibility of a light rail extension to Baltimore.

Proposed Actions: Explore the possibility of creating a full transit hub within the City. Investigate sites including the Grauls shopping center and the old state police barracks.

CO₂e Reductions: 28 metric tons of CO₂e, 0.02% towards 2012 reduction goal (assumes 50 new daily riders)

Goals: greater mass transit options, lower GHG emissions

Timeframe: Long-term

Department: Transportation Department

Strategy B: Make Annapolis bike & pedestrian friendly

Action Items

- **Safe Routes (walk) to School program**

Description: Fewer than 15 percent of all school trips are made by walking or bicycling, one-quarter are made on a school bus, and over half of all children arrive at school in private automobiles. This decline in walking and bicycling has had an adverse effect on traffic congestion and air quality around schools, as well as pedestrian and bicycle safety. The purpose of the Federal Safe Routes to School (SRTS) Program is to address these issues head on. The Program makes funding available for a wide variety of programs and projects, from building safer street crossings to establishing programs that encourage children and their parents to walk and bicycle safely to school. Funds can also be used to improve sidewalks, crosswalks, and pedestrian signals.

NOTE: City is currently a member of this program

Proposed Actions: Continue participating in this program

CO₂e Reductions: 0.28 metric tons of CO₂e, 0.005% towards 2012 reduction target (assumes 200 students walking)

Goals: Lower GHG emissions, less car use, improved public health, improved air quality, less congestion

Timeframe: Mid-term

<http://safety.fhwa.dot.gov/saferoutes/>

Department: Public Works Department, Department of Neighborhood & Environmental Programs

- **Bike rental ports, lockers, maps, racks, showers**

Recommended by Transportation Department

Description: Employee incentives to choose alternative transportation are improved with an established program with amenities such as storage, lockers, and showers.

Proposed Actions: Convert a section of the market house or old Rec & parks building to a bike hub with showers and facilities for bikers. Incorporate employee showers and bike lockers into any renovations of city hall and the parking garage.

CO₂e Reductions: 49 metric tons of CO₂e, 0.04% towards 2012 reduction target (assumes 200 trips diverted weekly)

Goals: Cleaner air, lower GHG emissions, increased public health

Timeframe: Mid-term

Department: Transportation Department

- **Map & improve bike/pedestrian trail system**

Work is currently progressing on this by Rec & Parks

Description: Mapping trail systems can increase the number of recreational participation due to information and other data given in a brochure to residents and visitors. The city can utilize "Friends of" volunteer organizations to coordinate trail improvement events.

Proposed Actions: The city bike and pedestrian trails could be improved to incorporate rain gardens, pervious pavement, and energy efficient lighting. Create a map that shows the existing trail system.

CO₂e Reductions: 49 metric tons of CO₂e, 0.04% towards 2012 reduction target (assumes 200 trips diverted weekly)

Goals: Improved public health, less reliance on cars

Timeframe: Mid-term

Department: Recreation & Parks Department

- **Bike registration system**

Proposed Actions: Implement a bike registration system for residents to help prevent and track stolen bikes.

CO₂e Reductions: Minimal, through increased biking

Goals: Less stolen bikes, more use of alternative transportation

Timeframe: Short-term

Department: Police Department

- **Implement the recommendations in the Annapolis Bicycle Transportation Committee Final Report**

Suggestion received from the public

Description: Bicycles are appropriate in reducing the number of short-term trips—up to five miles or so—which constitute more than half of all driving. But bicycles can also serve longer trips, on their own or in combination with bus, rail, and ferry. Dedicated bike paths and bicycle lanes on roadways reduce the danger motor vehicles pose to bicyclists. While dedicated bicycle paths are ideal, 70 percent of bicyclists travel along-term regular traffic lanes. Among the range of barriers these bicyclists must contend with are wide roads that are difficult to cross, signals that won't detect bicycles, and poor street maintenance along the edges of roadways. A feedback process is essential to the program. Prepaid postcards placed in bicycle shops or a dedicated web page allow citizens to recommend improvements such as filling potholes, removing cracks, and replacing sewer grates with bicycle-safe grates.

Proposed Actions: Install more bike lanes (off/on street) as recommended in Annapolis Bicycle Transportation Committee Final Report. Map off-road bike paths. Leave comment cards in local bike shops.

CO₂e Reductions: 49 metric tons of CO₂e, 0.04% towards 2012 reduction target (assumes 200 trips diverted weekly)

Climate Action – Transportation

Goals: Cleaner air, lower GHG emissions, improved public health

Timeframe: Short-term

Cost: Installation of new lanes
Installation of bike crossing lanes
Mapping existing lanes
Outreach materials for local bike shops

Department: Public Works Department, Transportation Department

- **Traffic calming for bike/pedestrian safety**

Suggestion received from the public

Description: Traffic calming measures can be in the form of police enforcement and education in addition to physical measures such as speed bumps or median islands and side bars. These measures encourage drivers to drive more responsibly, and it will increase bike and pedestrian safety.

Proposed Actions: Install traffic calming devices along some major roads, such as Duke of Gloucester, Chesapeake Ave, and Boucher Ave, to help promote increased walking and bike usage.

CO₂e Reductions: 37 metric tons of CO₂e, 0.03% towards 2012 reduction target (assumes 150 trips diverted weekly)

Goals: less cars on road, more walkers and bikers, cleaner air, less congestion

Costs: Installation and maintenance of the traffic calming measures

Timeframe: Mid-term

Department: Public Works Department

- **Create a city biking webpage for citizens**

Recommended by Transportation Department.

Suggestion received from the public

Proposed Actions: Consolidate city bike information into a web page dedicated to biking. It could feature bike safety, tips, and routes.

CO₂e Reductions: Minimal

Goals: Increased bike use in city, lower GHG emissions, less congestion

Timeframe: Mid-term

Department: Transportation Department, Management Information Technology

- **Expand bike loaner program**

Recommended by Transportation Department.

Suggestion received from the public

Proposed Actions: Expand the bike loaner program to other parts of the city.

CO₂e Reductions: 44 metric tons of CO₂e, 0.04% towards 2012 reduction target (assumes 25 bikes available)

Goals: Increased bike use in city, cleaner air, lower GHG emissions, less congestion

Timeframe: Mid-term

Cost: Funding currently being explored.

Department: Transportation Department

- **Sidewalk improvement**

Suggestion received from the public

Description: Improve sidewalks to make them more walkable and safe. Improving lighting (with minimal light pollution) along walkways and streets will improve public safety and increase public utilization of the sidewalks.

Proposed Actions: Repair sidewalks as needed. Purchase antique style, dark skies lighting to improve lighting on any pedestrian paths or sidewalks where it is found to be needing improvement.

CO₂e Reductions: 49 metric tons of CO₂e, 0.04% towards 2012 reduction target (assumes 200 trips diverted weekly)

Goals: Increased public utilization of sidewalks, less reliance on cars, cleaner air

Timeframe: Mid-term

Cost: \$1,000-\$1,500 per pole

<http://www.antiquastreetlamps.com/Products/DarkSkies/>

Department: Public Works Department

- **Continue to integrate bikes & transit**

Transportation Department already has bike racks on all the busses and racks in each of the garages. Bike racks are available to interested businesses.

Suggestion received from the public

Description: Combining bicycles with transit can extend the use of both, allowing transit to be used when the destination is too far from a transit stop for walking. A survey found that 30% of users of bike lockers at a transit station in Vancouver, BC had not used transit before the lockers were installed. Transit systems should reverse policies, common in many communities, which discourage or prohibit using a bicycle with a bus or a train. They can do this through measures like putting bike racks on buses, trolleys, and ferries, adding special cars or special equipment to trains, implementing bicycle-friendly policies in stations and trains, and training employees to be tolerant of the needs of bicyclists. They can also provide bike lockers or other secure facilities at stations and stops, as well as design stations with bike ramps and other amenities.

Proposed Actions: Continue taking steps to better integrate bicycling with other modes of transit.

CO₂e Reductions: 30 metric tons of CO₂e, 0.03% towards 2012 reduction target (assumes 20 new riders)

Goals: Cleaner air, lower GHG emissions

Timeframe: Short-term

Department: Transportation Department

Strategy C: Promote/increase use of alternative transportation methods

Action Items

- **Promote city's clean commuting program**

Description: Clean Commute initiatives are programs sponsored by Annapolis Department of Transportation to help encourage commuters in and around Annapolis to choose an alternative to driving alone.

Proposed Actions: Promote the city's clean commuting website.

CO₂e Reductions: 58 metric tons of CO₂e, 0.05% towards 2012 reduction target (assuming 50 residents carpooling, 200 daily trips diverted through biking)

Goals: lower GHG emissions, cleaner air, less congestion

Timeframe: Short-term

<http://www.annapolis.gov/info.asp?page=2613>

Department: Transportation Department

- **Alternative transit-oriented development**

Description: Presently, we demand that developers build parking facilities, attracting more single occupancy automobiles. Instead, we should restrict the quantity of on-site parking and demand participation in alternative transportation schemes: bike, pedestrian, ride-sharing, and transit.

Proposed Actions: Update zoning to encourage transit-oriented development rather than attracting single occupancy automobiles.

CO₂e Reductions: 588 metric tons of CO₂e, 0.50% towards 2012 reduction target (assumes 100 residential units in TOD)

Goals: Lower GHG emissions, cleaner air

Timeframe: Mid-term

Department: Planning & Zoning Department, Transportation Department

- **Set standards for transit-friendly city roads**

Description: To further encourage those alternatives, the way we design and use our streets needs to be revamped. We have set standards for the car's asphalt but make no such requirements for people's sidewalks. The city is just beginning to develop a complete streets standard. The sidewalk program which would have created funding to implement complete streets was eliminated. To attract more residents to bikes and walk to local destinations, we need accessible sidewalks and safe bikeways buffered from the auto traffic flow. To accomplish this goal, portions of the automotive right of way must be released to the human scale.

Proposed Actions: Create a transit-friendly street standard that will be used for any new or renovated roadways within the City.

Transit-friendly streets must create space for bikes and upgrade sidewalks to be pedestrian friendly.

CO₂e Reductions: 49 metric tons of CO₂e, 0.04% towards 2012 reduction target (assumes 200 trips diverted weekly)

Goals: Lower GHG emissions, cleaner air

Timeframe: Mid-term

Department: Planning & Zoning Department, Transportation Department

- **Discourage habitual single occupancy vehicle usage**

Recommended by the Transportation Department

Description: As a disincentive, the cost for habitual single occupancy vehicle use in the City should be prohibitive. Monthly downtown parking permits should be at market rates and on-street visitor parking should be restricted and enforced. Travel and parking access by SOV should be more expensive and more difficult than the use of alternative transport systems.

Proposed Actions: Make the parking permits and garages market rate. Make any travel and parking access by SOV more expensive. Encourage use of non-SOV transportation.

CO₂e Reductions: 49 metric tons of CO₂e, 0.04% towards 2012 reduction target (assumes 200 trips diverted weekly)

Goals: Cleaner air, less GHG emissions

Timeframe: Mid-term

Department: Transportation Department

- **Alternative transportation network program**

Description: Work with Annapolis Regional Transportation Management Association (ARTMA) to utilize a web-based transportation network program that City workers and residents can use to easily find rideshare opportunities, bike routes, mass transit routes, and other alternative transit options for their daily commute. Workers would be able to use a mapping program to plug in their beginning and ending commuting destinations and see all available options.

Proposed Actions: Work with ARTMA to create an Annapolis-area public transportation network program.

CO₂e Reductions: 58 metric tons of CO₂e, 0.05% towards 2012 reduction target (assuming 50 residents carpooling, 200 daily trips diverted through biking)

Goals: Cleaner air, less GHG emissions

Timeframe: Mid-term

Department: Transportation Department

www.greenride.com

- **Zip/flex car programs at area transit hubs**

Recommended by the Transportation Department

Description: Car share programs such as the Zip car and Flex car help to lower peoples' reliance on automobiles. Instead of having to own automobiles personally, which may encourage more use, residents will be able to use a shared car only when they absolutely need it.

Proposed Actions: Setup a car-share program at local transit hubs.

CO₂e Reductions: 29 metric tons of CO₂e, 0.02% towards 2012 reduction target (assumes 25 participants)

Goals: Cleaner air, less GHG emissions

Timeframe: Mid-term

Department: Transportation Department

- **Encourage parking at the Naval Stadium**

Suggestion received from the public

Proposed Actions: Open up the Naval stadium parking for tourists to use on the weekend to get to the downtown area without driving.

Goals: Less GHG emissions, cleaner air

Timeframe: Short-term

Department: Transportation Department

- **Car-free days**

Suggestion received from the public

Proposed Actions: Promote days where people are encouraged to not drive their cars.

CO₂e Reductions: 49 metric tons of CO₂e, 0.04% towards 2012 reduction target (assumes 600 trips diverted monthly)

Goals: lower emissions, lower VMT, lower GHG emissions

Timeframe: Mid-term

Department: Transportation Department

Already part of the clean commute program

GOAL: REDUCE TRANSPORTATION EMISSIONS FROM COMMUNITY

Strategy A: Reduce emissions from vehicle usage

Action Items

- **Tour-bus hook-up on West Street and other suitable locations**

Description: Tour busses for bands park along West Street and often idle so they can power all their equipment. Providing an electric hookup will prevent them from having to idle.

Proposed Actions: Install an electric hookup on West St for tour busses to hookup to instead of idling while their artists perform.

CO₂e Reductions: Minimal

Goals: Lower air pollution, lower emissions

Timeframe: Mid-term

Cost: Hook-ups

Department: Transportation Department, Central Services

- **Clean Air Cab program**

Recommended by Transportation Department.

Description: A program can be started where taxi cab companies can replace their vehicles with an Annapolis-approved clean air vehicle, such as a CNG, hybrid, electric, or bio-fuel vehicle. This will not only help to promote cleaner air in the city, but will also extend the life of the vehicles and lower the fuel Costs of the taxi companies. Boston launched a Clean Air CABS program in 2007. Federal tax credits were used by cab companies to help pay for the newer clean cabs.

CO₂e Reductions: 33 metric tons of CO₂e, 1.01% towards 2012 reduction target (10 vehicles)

Goals: cleaner air, lower Costs, less fuel used

Proposed Actions: Start an Annapolis Clean Air Cabs program.

Costs: Federal tax credits and natural gas company rebates may be available.

<http://www.bphc.org/bphc/cleanaircabs.asp>

- **Traffic counting program**

Description: Traffic count data will help in determining how successful trip reduction and transit programs have been, evaluate the need for road improvements, traffic signal installations, traffic signal modifications, guard rail installations, flashing beacon installations and bike and pedestrian projects.

Proposed Actions: Create a traffic counting program for all types of city roads and neighborhoods.

Goals: More effective program evaluation, ability to more accurately calculate city GHG emissions

Department: Public Works Department, Transportation Department, Planning & Zoning

- **Launch no-idling campaign**

Suggestion received from the public

Proposed Actions: Install no-idling education signs in a few appropriate locations. Create bumper stickers and a sign/display at city dock with more detail. Launch a public information campaign.

CO₂e Reductions: 272 metric tons of CO₂e, 0.23% towards 2012 reduction target (assumes 200 heavy truck and 50 busses)

Goals: Lower GHG emissions, cleaner air

Timeframe: Short-term

Climate Action – Transportation

Cost: Signs and outreach materials
Recommended by the Transportation Department
Department: Transportation Department

ENERGY EFFICIENCY

GOAL: 50% REDUCTION OF ENERGY USE (2006 BASELINE) OF ALL PUBLIC OWNED OR LEASED FACILITIES BY 2012

Strategy A: Increase energy efficiency of City facilities

Action Items

- **Pumping stations and water works energy efficiency upgrades**

Description: Many water systems have old, inefficient pumps that can be upgraded with short payback times from energy savings. Motors can be rewound for greater efficiency. Variable speed drives allow a pump to operate more efficiently. Pump sizing is also important as oversized pump wastes energy. Combining multiple pumps of different sizes can allow a smaller pump to be sufficient for normal operations, with the additional pump meeting peak demand. Pump system optimization can reduce energy use by 20%. Regular preventative inspection and maintenance keeps pumping systems working efficiently. Monitoring energy use of each component helps decide where further improvements can be made. Controlling leaks is also an important component of improving system efficiency.

NOTE: A complete study of the water treatment facility is underway, including new energy efficiency measures to be implemented over the next several years

Proposed Actions: Investigate energy efficiency options at city water plant and pumping stations, such as variable speed drives, pump sizing, pump combinations, pump optimization, and leak control.

CO₂e Reductions: 710 metric tons of CO₂e, 21.40% towards 2012 reduction target (assumes 20% efficiency improvement)

Goals: Decrease energy used by the water works park and pumping stations, lower emissions = lower Costs

Timeframe: Mid-term

Cost: Varies depending on actions.

<http://www.epa.gov/region09/waterinfrastructure/technology.html>

Department: Public Works Department

- **Install energy efficient lighting**

Description: Lighting is typically the largest electricity user in commercial buildings. Most commercial buildings use fluorescent lighting, which is relatively efficient, but many buildings still have older fixtures with magnetic ballasts and T-12 size fluorescent tubes. New electronic ballasts with T-8 size tubes use 30% less energy and can provide better light quality without flicker.

Proposed Actions: Install CFLs in government buildings where possible.

CO₂e Reductions: Efficient lighting retrofits – 614 metric tons of CO₂e, 18.79% towards 2012 reduction target (assumes 600,000 ft² retrofitted)

Goals: Lower electricity Cost, lower GHG emissions

Timeframe: Short-term

Cost: \$0.06 cost of retrofit per square foot, payback in 0.2 years, annual cost savings of \$121,820

Department: Central Services

- **Install occupancy sensors**

Description: Lighting is typically the largest electricity user in commercial buildings. Much energy is wasted by lights left on when no one is using them. Installation of lighting occupancy sensors prevent this by using sensors to detect motion in the lighted space and turning lights off if no one is present. Sensors can reduce energy use for lighting by an average of 35%. Sensors are usually either ultrasonic or infrared. If no motion is detected after a set delay period, the sensor turns the lights off or dims them. Occupancy sensors are a low-Cost way to save energy on lighting, with typical payback in less than two years.

Proposed Actions: Install light sensors where possible. Employee zone lighting may need to be installed in some buildings.

CO₂e Reductions: Lighting occupancy sensors – 716 metric tons of CO₂e, 21.93% towards 2012 reduction target (assumes 600,000 ft² retrofitted)

Goals: Lower electricity Cost, lower GHG emissions

Timeframe: Short-term

Cost: \$0.06 cost of sensors (per square foot), payback in 0.2 years, annual cost savings of \$142,124

Department: Central Services

- **Install energy monitors**

Proposed Actions: Install energy monitors in employee areas of the building so that employees can monitor in real-time how much energy is being used.

CO₂e Reductions: 150 metric tons of CO₂e, 4.77% towards 2012 reduction target

Goals: Lower GHG emissions, lower Costs

Timeframe: short-term

Costs: Energy monitor

Department: Central Services

- **Install waterless urinals, high efficiency toilets, and sinks with sensors**

HUMAN RESOURCES

Description: Less water that is being pumped means more energy and Cost savings, and a healthier aquifer. Toilet flushing can account for one third of water use in commercial and office buildings. New High Efficiency Toilets with the WaterSense label use 1.3 gallons per flush or less, compared to the current federal standard of 1.6 gallons per flush. Old toilets may use 3.5 or 5 gallons or more per flush. High Efficiency Urinals use 0.5 gallons per flush or less compared to the current federal standard of 1.0 gallons per flush. Old urinals may use 2-3 gallons or more per flush. Non-flushing urinals with zero water use are also available, using a liquid seal. Because these urinals do not need a flush valve their maintenance Costs are lower. The greatest savings are obtained by replacing older toilets and urinals with a high flush volume, and toilets in high use areas.

Proposed Actions: Install faucets that use motion sensors to prevent leakage and to lower the volume of water used. Low-flow toilets can be installed, along with waterless urinals in the men's restrooms.

CO₂e Reductions: 3 metric tons of CO₂e, 0.08% towards 2012 reduction goal (assumes 50 toilets, faucets, and 5 shower heads retrofitted)

Goals: Energy savings, lower GHG emissions

Timeframe: Short-term

Cost: Motion sensing faucets - \$300 each

Waterless urinals - \$400 each

Low flow toilet - \$100-1,000 each

Department: Central Services

- **Energy efficient exit signs**

Description: illuminated exit signs are required in all public buildings. Today, over 100 million exit signs in use throughout the U.S. consume 30-35 million kWh of energy and cost \$1 billion to operate annually.

One simple measure that local governments can take to reduce their greenhouse gas (GHG) emissions and achieve energy savings is to install light emitting diode (LED) exit signs in municipal buildings. Older exit signs are lit by incandescent bulbs and use 40 watts per sign, while LED signs use 5 watts or less per sign; a savings of 87%.

In addition to offering big energy savings over traditional incandescent lamps, LED exit signs last much longer and fail less frequently, reducing maintenance costs. Combined savings on maintenance and energy costs pay for the new signs in about a year. Local governments using this technology can organize group purchases to further reduce initial costs.

Proposed Actions: Replace the existing exit signs with energy efficient signs.

CO₂e Reductions: 14 metric tons of CO₂e, 0.41% towards 2012 reduction target (assumes 100 signs replaced)

Goals: Energy savings, lower GHG emissions, cost savings

Timeframe: Short-term

Department: Central Services

- **Purchase energy efficient appliances**

Proposed Actions: As appliances break or get old, replace with energy star appliances.

Goals: Lower GHG emissions, lower Costs

CO₂e Reductions: 2 metric tons of CO₂e, 0.07% towards 2012 reduction target (assumes 10 refrigerators replaced)

Timeframe: short-term

Costs: Varies depending on the appliance.

Department: Central Services

- **Install programmable thermostats and remote temperature monitoring**

Description: Will allow for programming certain temperatures during the day, at night, and during the weekend, when the heat does not have to be on.

Proposed Actions: Replace existing thermostats with energy star programmable thermostats.

CO₂e Reductions: 150 metric tons of CO₂e, 4.77% towards 2012 reduction target

Goals: Lower GHG emissions, lower energy use/Costs

Timeframe: Short-term

Cost: \$30 per unit

Department: Central Services

- **Install vending misers on city vending machines**

Description: Vending Miser is an energy efficiency tool for vending machines. It saves money on power by turning off lighting and managing compressor cooling cycles when they are not needed.

Proposed Actions: Install vending misers on all city-owned vending machines

CO₂e Reductions: 8 metric tons of CO₂e, 0.25% towards 2012 reduction target

Goals: Reduced energy use, lower GHG emissions, lower costs

Timeframe: Short-term

Cost: \$170 per miser

Department: Central Services

- **Energy efficient windows**

Description: Replacing single-pane windows can save \$126-\$465 a year; replacing double-pane clear glass can save \$27-\$111 a year. Rehabilitation of existing windows should be prioritized over replacement, especially in the case of historic windows.

Proposed Actions: Conduct energy audit to find the most inefficient windows and replace or insulate where possible.

CO₂e Reductions: 150 metric tons of CO₂e, 4.77% towards 2012 reduction target

Goals: Reduced energy use, lower GHG emissions, lower costs

Timeframe: Short-term

Cost: \$330 (low end) per window

Insulating plastic sheeting - \$20 a roll

Grant possibilities

Department: Central Services, Historic Preservation Office-Planning & Zoning

Climate Action – Other

- **Overhaul government building HVAC systems and investigate combined heat & power**

Description: Energy used to heat, cool, and ventilate contributes to the majority of energy used in buildings. Improving the efficiency of the equipment used for these tasks reduces emissions and saves on climatization Costs. To maximize energy savings, upgrade to the most efficient chillers, boilers, and HVAC units. Replacing older units with appropriately-sized and the most efficient new units can reduce energy use about 30%.

In 2003 the City of Menlo Park hired a firm to perform an energy audit and retrofit of the heating, ventilation, and air conditioning (HVAC) systems in the Administration / City Hall Buildings and the Library. The new HVAC systems that were installed saved the city \$34,563 in 2005 compared to electricity and gas bills from 2002/2003, and reduced greenhouse gas emissions by 319 metric tons of CO₂e. The project Cost \$90,180, for a simple payback of 2.6 years

Proposed Actions: Replace or upgrade city HVAC systems where possible. Energy audits can help determine if the HVAC system is leaking.

CO₂e Reductions: 62 metric tons of CO₂e, 1.89% towards 2012 reduction target (assumes 300,000 ft² of effected space)

Goals: Increase energy efficiency, lower GHG emissions, lower Costs, improved employee production

Timeframe: Mid-term

Cost: \$400 - \$90,000

Department: Central Services

- **Become EPA Energy Star partner**

Description: Government agencies spend more than \$10 billion a year on energy to provide public services and meet constituent needs - while grappling with tightening budgets. Energy use in commercial buildings and industrial facilities is responsible for more than 50 percent of U.S. carbon dioxide emissions. Therefore, it is imperative that any local government looking to reduce greenhouse gas emissions pay special attention to its own buildings and the buildings in its community.

The opportunity to reduce these emissions is significant because as much as 30 percent of the energy consumed in commercial buildings is often used unnecessarily or inefficiently. Through ENERGY STAR, the EPA provides your city or county a proven energy management strategy and no-Cost tools to save energy and money, as well as demonstrate your environmental leadership.

Local governments play a vital dual role in helping meet the Goals of the ENERGY STAR Challenge to improve the energy efficiency of America's buildings by 10 percent or more - they lead by example by improving their own buildings and they leverage relationships with private sector organizations to motivate these groups to do the same.

Local and state governments, as well as federal agencies, that partner with EPA and take the ENERGY STAR Challenge demonstrate their commitment to taxpayers as well as the environment.

Proposed Actions: Become EPA energy star partner.

CO₂e Reductions: Depends on the actions taken.

Goals: Increased energy efficiency, lower GHG emissions

Timeframe: Short-term

Department: Office of the Mayor

- **Join Energy Star Portfolio Manager**

Description: Portfolio Manager is an interactive energy management tool that allows you to track and assess energy and water consumption across your entire portfolio of buildings in a secure online environment. Whether you own, manage, or hold properties for investment, Portfolio Manager can help you set investment priorities, identify under-performing buildings, verify efficiency improvements, and receive EPA recognition for superior energy performance.

Proposed Actions: Join Energy Star's Portfolio Manager Program.

CO₂e Reductions: Depends on the actions taken.

Goals: Increase building energy efficiency, lower GHG emissions, lower costs

Timeframe: Short-term

Cost: Staff time

Department: Central Services

- **Require Energy Star standards for leased properties**

Proposed Actions: Require that projected energy Costs are evaluated when considering new leases or lease renewals or set an energy Cost per square foot maximum for new leases of office space.

CO₂e Reductions: Up to 25% in energy savings compared to typical building

Goals: Lower Costs, lower GHG emissions

Timeframe: Mid-term

Department: Central Services

- **Performance contracting**

Description: A performance-based procurement method and financial mechanism for building renewal whereby utility bill savings that result from the installation of new building systems (reducing energy use) pay for the Cost of the building renewal project. A "Guaranteed Energy Savings" Performance Contract includes language that obligates the contractor, a qualified Energy Services Company (ESCO), to pay the difference if at any time the savings fall short of the guarantee.

Proposed Actions: Use performance contracting to help finance future projects.

CO₂e Reductions: Depends on the actions taken.

Goals: Increased energy efficiency, capital for new projects, Cost savings

Department: Central Services, Housing Authority of the City of Annapolis

- **Designate energy efficiency manager in each department**

Proposed Actions: Designate an energy efficiency manager in each department. The managers would help to lead energy efficiency improvements and sustainability improvements that their departments could implement. Periodic meeting amongst the managers and the city's sustainability coordinator could be held.

CO₂e Reductions: Depends on the actions taken.
Goals: Lower GHG emissions, greater energy efficiency
Timeframe: Short-term
Departments: All

- **Institute building power management**

Proposed Actions: Setup all City buildings with a power and HVAC management, control and monitoring network and system.
Change lighting to activate only when someone is present. Use setback temperature controls for nights and weekends when people are not present.
CO₂e Reductions: 647 metric tons of CO₂e, 22.97% towards 2012 reduction target (assumes 500,000 ft² with lights out with temperature regulation)
Goals: Increased energy efficiency, lower Costs, lower GHG emissions
Costs: Low. Network exists, building management, control and monitoring systems exist but not linked together nor actively utilized.
Timeframe: Short-term
Department: Management Information Technology, Central Services

- **Green roof survey of City-owned buildings**

Description: The term "greenroof" is that of a system of vegetative surfaces growing on an impermeable surface like flat roof tops. The purpose of a greenroof is to provide a stormwater management system utilizing previously unviaible surfaces in urbanized areas. Extensive greenroof systems contain between 2 and 4 inches of soil with foliage from 2 to 6 inches. Modular green roof systems can be installed on existing roofs with a thickness and weight that will not endanger the integrity.
Proposed Actions: Survey existing City-owned building roof real estate to determine what roofs and buildings have adequate space and roofs for installation of green roofs. Grant funding can be pursued for the actual installations.
CO₂e Reductions: 3 metric tons of CO₂e, 0.11% towards 2012 reduction target (assumes 10,000 ft² effected)
Goals: Improved water quality, energy conservation, mitigation of urban heat island effect
Time Frame: Mid-term
Cost: For extensive greenroofs, \$14-\$25/ft² including roofing membranes, grant opportunities
http://www.mde.state.md.us/Programs/WaterPrograms/WQIP/wqip_stormwater.asp

- **Routine cleaning of City facility HVAC systems and vents**

Description: A regular maintenance program for City HVAC systems can help to improve the efficiency of those systems, provide a more stable climate for employees, and improve the health of employees. Maintenance should include repairing leaks and flushing the system of any accumulated dust and dirt.
Proposed Actions: Perform routine cleaning of City facility HVAC systems and vents.
CO₂e Reductions: 52 metric tons of CO₂e, 1.60% towards 2012 reduction target (assumes 300,000 ft² effected)
Goals: Increase energy efficiency, lower GHG emissions, lower Costs, improved employee health
Timeframe: Short-term
Department: Central Services

- **Switch electric and oil heat to natural gas**

Description: Electric heating is inherently inefficient; it is only about one third as efficient as burning fuel directly for heat. This effect is compounded when the electricity is generated from coal, the most polluting fossil fuel. Switching from electric heat to natural gas can significantly reduce emissions associated with heating buildings.
Proposed Actions: Convert any public buildings currently using electric heat to natural gas heat.
CO₂e Reductions: 112 metric tons of CO₂e, 3.43% towards 2012 reduction target (assumes 50,000 ft² effected)
Goals: Increase energy efficiency, lower GHG emissions
Timeframe: Short-term
Department: Central Services

- **Reflective roofing**

Description: Buildings account for 40% of total energy use and about 35% of GHG emissions in the United States. Air conditioning is a close second to lighting for electricity use in most commercial buildings. A reflective roof can significantly reduce this use by reducing the heat entering the building through the roof. ENERGY STAR certified reflective roof products reflect at least 65% of sunlight striking the roof, lowering roof temperature by up to 100 °F.
Reflective roofs also reduce the urban heat island effect, reducing cooling energy use for all buildings in the city.
Reflective roofs also contribute to a LEED certification.
Proposed Actions: Install reflective roofing where green roofing cannot be installed
CO₂e Reductions: 20 metric tons of CO₂e, 0.61% towards 2012 reduction target (assumes 50,000 ft² effected)
Goals: Increase energy efficiency, lower GHG emissions
Timeframe: Mid-term
Department: Central Services

- **Irrigation control sensors**

Description: Water pumping, purification, and wastewater treatment can represent a large portion of municipal energy use. Urban water supplies require energy to transport, treat, distribute, and to treat wastewater. Controls using either soil moisture or weather sensors save water by only irrigating when plants need it. Irrigation control sensors save an average of 26% on irrigation water use.
Proposed Actions: Install irrigation control sensors on any automated irrigation systems owned by the City
CO₂e Reductions: 3 metric tons of CO₂e, 0.09% towards 2012 reduction target (assumes 10 acres effected)
Goals: Increase water efficiency, lower GHG emissions
Timeframe: Short-term

Department: Central Services

- **Reduce hours street lights are on each day**

Description: Street lighting is often one of the largest items in the energy budget for local governments. If there are some hours of the night that street lights are not needed, turning them off can save considerable energy and emissions. In conjunction with this measure, governments should make sure street lamps and lamp fixtures are the most efficient available when they are on.

Proposed Actions: Reduce the average daily time street lights operate each day

CO₂e Reductions: 180 metric tons of CO₂e, 5.50% towards 2012 reduction target (assumes time reduced by 2 hours each day)

Goals: Lower city energy use and GHG emissions

Timeframe: Short-term

<http://www.oksolar.com/ilighting/>

Department: Public Works Department

- **Replace current street lights with efficient lighting (non-LED)**

Description: Street lighting is often one of the largest items in the energy budget for local governments. Many cities still have older, inefficient, mercury vapor lamps in street lights. Metal halide and high pressure sodium lamps use about 35% less energy than mercury vapor lamps do, reducing emissions from electricity production.

Switching to more efficient street lights will have a small effect on local air quality, but when efficient street lights are purchased as a part of a broader green procurement or energy efficiency program a significant reduction in electricity use can be realized.

Metal halide are preferred over sodium lights in some places because they provide better color rendering. It is important to pay attention to streetlight fixtures, as best visibility and safety are achieved with uniform light, which minimizes glare. The design of full cut-off light fixtures reduces light pollution and glare, using light more efficiently by directing it where it is needed. The quality and appearance of lighting can influence the ambience of a built environment. For example, post-top fixtures can create a more pleasant atmosphere in shopping districts than cobrahead fixtures.

Proposed Actions: Replace all mercury vapor street lights and traffic signals with metal halide and high pressure sodium lamps to lower energy used by the city. This will result in annual cost savings.

CO₂e Reductions: 214 metric tons of CO₂e, 6.50% towards 2012 reduction target (1,250 street lights replaced—half of total amount in city)

Goals: Lower city energy use and GHG emissions

Timeframe: Short-term

<http://www.oksolar.com/ilighting/>

Department: Public Works Department

- **Replace current street lights with LED lighting**

Suggestion received from the public

Description: Street lighting is often one of the largest items in the energy budget for local governments. Many cities still have older, inefficient, mercury vapor lamps or incandescent bulbs in street lights. LEDs have been used to successfully reduce energy use for traffic signals, and some cities are expanding their use to save energy for street lights. LEDs are highly efficient, and their light is directional, making it easy to focus them on roads, avoiding ambient light pollution and energy waste.

Proposed Actions: Replace all street lights and traffic signals with LEDs to lower energy used by the city. This will result in annual cost savings. Another option is solar powered fluorescents.

CO₂e Reductions: 164 metric tons of CO₂e, 5.01% towards 2012 reduction target (1,250 street lights replaced—half of total amount in city)

NOTE: Currently being investigated.

Goals: Lower city energy use and GHG emissions

Timeframe: Short-term

Cost: ~\$400 per bulb

Conversion kit

MEA grant opportunities

Savings: Can save \$100 per street light after the replacement. Lowers maintenance costs because the bulbs do not have to be changed as often.

<http://www.oksolar.com/ilighting/>

Department: Public Works Department

GOAL: GREATER ENERGY AND WATER EFFICIENCY FOR ALL BUILDINGS AND STRUCTURES IN THE CITY

Strategy A: Residential, commercial, and industrial building energy efficiency

Action Items

- **Low-income energy efficiency home improvements**

Description: A program to help low-income earners weatherize is a win-win opportunity to reduce emissions while saving money for low-income residents. A weatherization program can reduce energy Costs, creating more income to be spent on necessities while, at the same time, reducing GHG emissions due to decreased energy use.

Portland, Oregon's Block-by-Block program weatherizes 120 low-income homes a year, saving \$14,000 in energy Costs and 215 Billion BTUs a year. Participants are recruited by door-to-door outreach and energy fairs.

Climate Action – Other

Proposed Actions: Low-income weatherization programs seal cracks around windows and doors, add insulation, and replace inefficient appliances, reducing energy-use related GHG emissions and lowering utility bills.

CO₂e Reductions: 473 metric tons of CO₂e, 0.40% towards 2012 reduction target (assumes 250 homes affected)

Goals: Lower GHG emissions, lower Costs for residents, money directed to improvements rather than energy Costs

Costs: Federal grant opportunities

Varies depending on what the problems are.

Department: Office of Youth & Community Affairs, Historic Preservation Office-Planning & Zoning

- **Public housing energy efficiency home improvements**

Description: A program to help public housing residents weatherize is a win-win opportunity to reduce emissions while saving money for low-income residents. A weatherization program can reduce energy Costs, creating more income to be spent on necessities while, at the same time, reducing GHG emissions due to decreased energy use.

Portland, Oregon's Block-by-Block program weatherizes 120 low-income homes a year, saving \$14,000 in energy Costs and 215 Billion BTUs a year. Participants are recruited by door-to-door outreach and energy fairs.

Proposed Actions: Low-income weatherization programs seal cracks around windows and doors, add insulation, and replace inefficient appliances, reducing energy-use related GHG emissions and lowering utility bills.

CO₂e Reductions: 473 metric tons of CO₂e, 0.40% towards 2012 reduction target (assumes 250 homes affected)

Goals: Lower GHG emissions, lower Costs for residents, money directed to improvements rather than energy Costs

Costs: Federal grant opportunities

Varies depending on what the problems are.

Department: Housing Authority of the City of Annapolis

- **Promote EZ energy program**

Proposed Actions: Conduct more public outreach, promotion, and education about the program. This will be taken care of by the EZ energy non-profit group.

CO₂e Reductions: Depends on the actions taken

Goals: Lower GHG emissions, increased city renewable energy production, grow renewable economy, greater participation in EZ program

Timeframe: Short-term

Cost: Outreach/education/promotion materials – covered by non-profit

Department: Office of the mayor

- **Energy efficient windows, lead-threat window mitigation**

Description: Replacing single-pane windows can save \$126-\$465 a year; replacing double-pane clear glass can save \$27-\$111 a year. Rehabilitation of existing windows should be prioritized over replacement, especially in the case of historic windows.

Proposed Actions: Conduct energy audit to find the most inefficient windows and replace or insulate where possible.

CO₂e Reductions: 473 metric tons of CO₂e, 0.40% towards 2012 reduction target (assumes 250 homes affected)

Goals: Reduced energy use, lower GHG emissions, lower costs

Timeframe: Short-term

Cost: \$330 (low end) per window

Insulating plastic sheeting - \$20 a roll

Grant possibilities

Department: Office of Youth & Community Affairs, Department of Neighborhood & Environmental Programs, Historic Preservation Office-Planning & Zoning

- **Create web page offering links to energy efficiency information**

Description: Can be linked with the EZ energy program and BGE's Smart Energy Savers Program.

Proposed Actions: Create a web page on the City web site that has local information about what citizens can do to improve their energy efficiency, discuss solutions, and be linked to other resources.

CO₂e Reductions: 878 metric tons of CO₂e, 0.74% towards 2012 reduction target (assumes 1,000 homes reached)

Goals: Greater citizen energy efficiency, lower GHG emissions

Timeframe: Short-term

Department: Management Information Technology

- **Expand City Green Building program**

Description: After the existing green building program has been operating for a few years, it may need to be expanded and strengthened. Smaller, single family homes do not currently fall under the purview of the green building ordinance. As the prices of green home technology falls, it may make more sense for this program to be expanded to include all residential homes, and to increase the minimum standard from LEED certified to LEED silver.

Proposed Actions: Expand existing green building program/ordinance to apply to all buildings within the city.

CO₂e Reductions: 6,279 metric tons of CO₂e, 5.29% towards 2012 reduction target (assumes 2,000,000 ft² of renovation/new construction)

Goals: Lower GHG emissions, increased energy efficiency

Timeframe: Long-term

Department: Department of Neighborhood & Environmental Programs

- **Green building check-list**

Proposed Actions: Develop a green building check-list to aid citizens and builders in constructing green buildings and complying with the new green building legislation.

CO₂e Reductions: 785 metric tons of CO₂e, 0.66% towards 2012 reduction target (assumes 2,000,000 ft² of renovation/new construction)

Goals: lower GHG emissions, greater adoption of green building standards

Climate Action – Other

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Public education on energy efficiency**

Description: Promote better home insulation, energy efficient insulation, installing energy efficient lighting, etc.

Goals: Get citizens to adopt more energy efficiency measures, lower city GHG emissions

Proposed Actions: Create show highlighting energy efficiency improvements. It could be hosted by a local business person, energy rep, or city representative. A corresponding pamphlet could be created.

CO₂e Reductions: 878 metric tons of CO₂e, 0.74% towards 2012 reduction target (assumes 1,000 homes reached)

Costs: Grant opportunities

Department: Department of Neighborhood & Environmental Programs, Public Information Office

- **Energy efficiency trade-in/rebate programs**

Proposed Actions: Create rebate or trade-in programs for appliances, windows, mowers, light bulbs, etc.

CO₂e Reductions: 1290 metric tons of CO₂e, 1.04% towards 2012 reduction target

Goals: Increased energy efficiency, lower GHG emissions

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Environmental Stewardship Program**

Proposed Actions: Continue creating program that will give a green certification (and accompanying logo) to businesses who take actions to become more sustainable and to lower their carbon footprint.

CO₂e Reductions: 778 metric tons of CO₂e, 0.66% towards 2012 reduction target (assumes 100 businesses participating)

Goals: More green businesses, lower GHG emissions

Timeframe: Short-term

Cost: Outreach materials – Printing and design

Department: Department of Neighborhood & Environmental Programs, Department of Economic Affairs

- **Lights Out program for appropriate properties**

Description: Turning off any non-essential lighting at night, between the hours of 10pm and 6pm, can help to provide financial benefits to participating residents, lower their carbon footprint, and help to reduce light pollution. Light pollution obscures the views of the night sky and can negatively impact wildlife, especially migratory birds during their spring and fall migrations. Lights Out programs have been implemented in cities nationwide including Boston (<http://www.cityofboston.gov/environmentalenergy/lightoutboston.asp>), San Francisco (<http://lightsoutsf.org/>), and New York (<http://www.environmentalleader.com/2008/11/05/new-york-citydims-skyscrapers/>).

Proposed Actions: Implement a “Lights Out” program for appropriate properties

CO₂e Reductions: 5,970 metric tons of CO₂e, 5.03% towards 2012 reduction target (assumes 5,000,000 ft² of participating property)

Goals: Lower GHG emissions, less light pollution

Timeframe: Short-term

Department: Mayor’s Office, Department of Economic Affairs, Department of Neighborhood & Environmental Programs

- **Low-income homeowner rehabilitation program**

Description: A program for low-income City of Annapolis homeowners to make repairs to their homes. These home repairs help the low income owner meet local housing codes for health and safety conditions and allow low-income residents stay in their homes. Repairs include but are not limited to new HVAC systems, electrical systems, plumbing, roofs, windows, and doors. The City typically rehabilitates 6 – 10 homes per year at a cost of \$40,000 per home. The U.S. Department of Housing and Urban Development provides the funding for this program.

Proposed Actions: The current program includes improvements that reduce energy costs such as weather stripping, caulking, and sealing all openings, etc. to reduce air infiltration, insulating openings in the exterior walls, adequate ventilation in attics, etc and replacing antiquated HVAC systems. The City requires all general contractors to use energy star rated appliances, heating and air conditioning systems. City staff will coordinate projects with local weatherization agencies and will have an energy audit conduct before and after the repairs to check the effectiveness of the improvements.

CO₂e Reductions: 473 metric tons of CO₂e, 0.40% towards 2012 reduction target (assumes 250 homes affected)

Goals: Lower GHG emissions, lower energy costs for homeowners so that they may have more money for future repairs and expenses.

Costs: Program guidelines per household \$40,000 for repairs.

(Funds budgeted by Department of Housing and Urban Development/HUD)

- **Green/reflective roof program**

Description: Buildings account for 40% of total energy use and about 35% of GHG emissions in the United States. Air conditioning is a close second to lighting for electricity use in most commercial buildings.

A green roof uses a soil medium and plants on top of an impermeable membrane roof. They reduce building energy use by insulating the roof, and by cooling it through shading and evapotranspiration, the process by which plants draw water from the soil and release it to the air. A green roof also cools the air around surrounding buildings, and green roofs on many buildings through a city reduce the urban heat island effect. This saves on air conditioning energy for all buildings in the city.

Reflective roofs save the most energy in hot, sunny climates. A reflective roof will only save energy on a building with air conditioning, although it will keep a non-air conditioned building cooler. ENERGY STAR certified reflective roof products reflect at least 65% of sunlight striking the roof, lowering roof temperature by up to 100 °F. Reflective roofs also reduce the urban heat island effect, reducing cooling energy use for all buildings in the city. Reflective roofs also contribute to a LEED certification.

Proposed Actions: Start a program that promotes the installation of green/reflective roofing on local businesses and homes

Climate Action – Other

CO₂e Reductions: 57 metric tons of CO₂e, 0.04% towards 2012 reduction target

Goals: Increase energy efficiency, lower GHG emissions

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Irrigation control sensors**

Description: An average acre of lawn in the U.S. uses 652,000 gallons of water each year. Most automatic irrigation systems for lawns and landscaped areas are controlled by a timer that waters whether plants need it or not, wasting much water. Controls using either soil moisture or weather sensors save water by only irrigating when plants need it. Irrigation control sensors save an average of 26% on irrigation water use.

Proposed Actions: Promote the installation of irrigation sensors on properties within the city

CO₂e Reductions: 34 metric tons of CO₂d, 0.03% towards 2012 reduction target (assumes 100 acres affected)

Goals: Increase water efficiency, lower GHG emissions

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

- **Energy cap on new construction**

Suggestion received from the public

Description: An energy cap puts a cap on the amount of energy (Btu/ft²) or emissions for new homes. For example, Aspen, CO's Renewable Energy Mitigation Program charges homebuilders a fee based on projected excess carbon emissions of the home over 20 years. Homes are allowed 40,000 Btu/ft² each year, an amount calculated to be achievable with cost-effective efficiency measures in the local mountain climate. A home design expected to use more than that must pay \$340 per ton of carbon emitted over the next 20 years. Homes larger than 5,000 ft² must either install a solar energy system (electric or hot water) or pay a \$5,000 fee. The fees raised \$1.5 million in the first two years, and \$667,000 of that had been spent on projects saving 12,000 tons of carbon emissions. For more information, see: <http://www.grist.org/news/maindish/2002/07/31/clifford-remp/>

Proposed Actions: Institute an energy cap for new construction.

CO₂e Reductions: 37,000 metric tons of CO₂e, 31.00% towards 2012 reduction target (based on Aspen Colorado estimates)

Goals: Lower GHG emissions

Timeframe: Short-term

Department: Department of Neighborhood & Environmental programs

- **Energy and water efficiency in the building codes**

Suggestion received from the public

Description: The International Code Council (ICC) is developing new green building codes that could be adopted by the city to help increase the energy efficiency of area buildings.

Proposed Actions: Amend and adopt new energy efficiency codes to address energy efficiency concerns, such as requiring energy star products, efficient toilets, water efficiency, etc. Conduct public education about the updated codes.

CO₂e Reductions: 4,625 metric tons of CO₂e, 3.90% towards 2012 reduction target (assumes 4,000,000 ft² commercial, 500 new residential homes)

Goals: lower GHG emissions

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

- **Low cost home energy audits**

Suggestion received from the public

Proposed Actions: Utilize local students to perform home energy audits. Students have performed energy audits for school buildings and are interested in working with the city on some projects as a part of their class.

CO₂e Reductions: 2,093 metric tons of CO₂e, 1.76% towards 2012 reduction goal (assumes 4,000,000 ft² of effected real estate)

Goals: Lower GHG emissions, increased residential energy efficiency

Timeframe: Mid-term

Department: Office of the mayor

- **Community-based climate/kilowatt challenge**

Suggestion received from the public

Description: An energy efficiency challenge is an effective way to motivate people to save energy. A challenge keeps track of how much people are able to reduce their energy use and rewards the highest savings with a prize. A challenge can be conducted among city residents or among employees. The city resident challenge can go through the community associations. It simply requires a way to measure energy use before and during the competition. The competitive aspect of an energy efficiency challenge gets people's interest and motivates energy saving. A challenge gives people recognition for their individual or team energy saving actions. Posting standings in the competition at regular intervals maintains interest. The promise of even modest prizes can motivate significant energy savings. Another approach, used by the Low Carbon Diet Program, is to set up support groups in which people work together through a step-by-step program to reduce energy use.

Proposed Actions: Create a community climate challenge, similar to college "kilowatt challenges" where dorms and buildings compete for largest energy efficiency savings. Awards could be given out to communities for largest savings, largest number of participating citizens, most innovative actions, actions that most benefit the city, etc. Can utilize and train local students to give free energy audits to homes. Partner with regional utilities to provide some incentives.

CO₂e Reductions: 878 metric tons of CO₂e, 0.74% towards 2012 reduction target (assumes 1,000 homes reached)

Goals: Lower GHG emissions, greater citizen commitment to lower their carbon footprints

Timeframe: Short-term

Cost: Outreach materials – ~\$3,000 for production & printing
Awards

Department: Department of Neighborhood & Environmental Programs

- **Push mower rebate program**

Suggestion received from the public

Proposed Actions: Give a rebate for those want a push manual mower. Look into partnering with local business, such as True Value or Home Depot, which has a non-profit foundation that might be interested. Have program encouraging use of alternate-fueled mowers by commercial landscaping companies.

CO₂e Reductions: Minimal

Goals: Cleaner air, lower GHG emissions,

Timeframe: Mid-term

Cost: Outreach materials - ~\$3,000

Rebates up to a certain amount

Grants may be available

Department: Department of Neighborhood & Environmental Programs

RENEWABLE ENERGY

GOAL: REDUCE OUR DEPENDENCE ON CARBON-BASED FUELS

Strategy A: Increase City Government renewable energy capacity

Action Items

- **Investigate on-site energy generation (solar, wind, etc) for public facilities**
Proposed Actions: Conduct a study on city-owned buildings and land to determine if there are suitable sites for installation of on-site energy generation.
CO₂e Reductions: 87 metric tons CO₂e, 2.65% towards 2012 reduction target
Goals: Lower GHG emissions, increased municipal capital, Cost savings
Timeframe: Short-term
Cost: Survey Cost
Department: Central Services
- **Install solar water heaters**
Description: Water heating is the second largest energy user in homes, after space heating and cooling. Using hot water efficiently reduces energy use and emissions.
Proposed Actions: Replace water heaters on city buildings with solar water heaters.
CO₂e Reductions: 10 metric tons of CO₂e, 0.29% towards 2012 reduction target
Goals: Lower GHG emissions lower Costs
Timeframe: Mid-term
Cost: \$6,000 per system
Department: Central Services
- **Solar powered wireless access points**
Proposed Actions: Use solar panels to power various City wireless access points, cameras and repeaters.
CO₂e Reductions: Minimal
Goals: No energy consumption, lower GHG emissions, cleaner air.
Costs: Capital costs, high, operating costs, low.
Department: Management Information Technology
- **Purchase 20% green electricity**
Description: In 2006, the Annapolis Energy Efficiency Task Force recommended that Annapolis purchase 20% of the City's total energy needs from renewable sources by the year 2020. A resolution supporting all their recommendations was passed by the City Council in 2006. There is now a company called Clean Currents that provides 50% and 100% wind power for a lower market rate than BGE's standard rate. Annapolis is part of a consortium that purchases bulk energy at a lower than market rate.
Proposed Actions: Investigate the feasibility and cost effectiveness of purchasing 100% or 50% wind energy through a regional electricity provider.
CO₂e Reductions: 2,958 metric tons of CO₂e, 90.53% towards 2012 reduction target (assumes 20% energy from green sources)
Goals: Lower GHG emissions, cleaner air
Department: Purchasing department
- **Use geothermal heat pumps for heating and cooling**
Description: One particularly efficient technology for both heating and cooling is a geothermal heat pump (GHP), also called a ground source heat pump. GHPs are more efficient than traditional air-conditioning or heat pumps because they use the stable underground temperatures. The system functions by circulating fluid through a closed loop in wells or horizontal piping in the ground. A geothermal heat pump is a heat pump that either uses the earth as a source of heat when operating in heating mode, or as a heat sink, when operating in cooling mode. There are different types of GHPs available.
Energy used to heat, cool, and ventilate contributes to the majority of energy used in buildings. Improving the efficiency of the equipment and fuel used for these tasks reduces emissions and saves on climatization costs.
Proposed Actions: Find a suitable public building that is able to utilize a geothermal heat pump for heating and cooling.
CO₂e Reductions: 126 metric tons of CO₂e, 3.86% towards 2012 reduction target
Goals: Lower GHG emissions, cleaner air
Department: Central Services
- **Use solar heat for public swimming pools**
Description: Solar pool heating is a simple and cost-effective application of solar energy. By substituting the sun for fossil fuels, we can keep a pool warm without producing greenhouse gas emissions.
Solar heating can save on pool operation costs. Solar pool heating uses low-cost unglazed solar collectors. Pool water is circulated through the collectors by the existing filtration pump. This allows a simple and inexpensive solar energy system that usually pays for itself in energy savings in 1.5 to 7 years. All heated outdoor swimming pools should also have a pool cover, which reduces heat loss from the pool at night. Public swimming pools are high visibility locations for local governments to use solar energy and promote it to the public.

Climate Action – Renewable Energy

Proposed Actions: Find a suitable public building that is able to utilize a geothermal heat pump for heating and cooling.
CO₂e Reductions: 16 metric tons of CO₂e, 0.48% towards 2012 reduction target (assumes 2,000 ft² pool space)
Goals: Lower GHG emissions, cleaner air
Department: Central Services

Strategy B: Increase the amount of renewable energy produced/purchased in the city

Action Items

- **Investigate locations for community renewable energy production**

Description: Community-supported energy provides lower electricity prices and lower greenhouse gas emissions. It also helps to promote local entrepreneurship.

Proposed Actions: Investigate possible ideal locations for installation of renewable energy production on city-owned properties and right-of-ways.

CO₂e Reductions: Solar energy – 818 metric tons of CO₂e, 0.69% towards 2012 reduction target (assumes 1,000 kWh installed)

Tidal energy – 249 metric tons of CO₂e, 0.21% towards 2012 reduction target (assumes 500,000 annual kWh)

Wind energy – 5 metric tons of CO₂e, 0.00% towards 2012 reduction target (assumes 10,000 annual kWh)

Goals: Lower carbon emissions and lower energy prices, community-owned energy

Timeframe: Short-term

Department: Planning & Zoning Department

- **Update zoning to allow installation of renewable energy**

Proposed Actions: Determine if a zoning update is needed to allow for the installation of renewable energy by residents and businesses. Work with the historic preservation commission to allow for appropriate use of renewable energy in the historic district.

CO₂e Reductions: Solar energy – 818 metric tons of CO₂e, 0.69% towards 2012 reduction target (assumes 1,000 kWh installed)

Wind energy – 5 metric tons of CO₂e, 0.00% towards 2012 reduction target (assumes 10,000 annual kWh)

Goals: More renewable energy utilized by citizens and businesses, lower GHG emissions

Department: Planning & Zoning Department, Historic Preservation Office – Planning & Zoning

- **Methane flaring/capture at wastewater treatment plant**

Description: When organic matter like wood, paper, food, and yard wastes is placed in landfills, it decomposes anaerobically, producing methane. Methane is a GHG 21 times more powerful than carbon dioxide. Flaring gas generates carbon dioxide and water as by-products. The carbon dioxide released from landfills is not considered to contribute to global warming since it is considered part of the active carbon cycle, and was drawn from the air by plants that sequestered it as they grew.

Proposed Actions: Investigate capturing or flaring methane released from the wastewater treatment plant

CO₂e Reductions: Methane flaring: 16,425 metric tons of CO₂e, 502.68% towards 2012 reduction target (assumes 37,000 people served)

Department: Public Works Department

- **Program to urge citizens to purchase electricity from renewable energy sources**

Description: Green energy purchases allow an institution or home to use energy from renewable energy sources such as solar, wind, and biomass generation, without having to generate that energy themselves. Many local utilities offer a green electricity option. The utility owns the renewable generation sources or purchases electricity from those who do, and sells green electricity to customers who sign up for it. The more green electricity customers buy, the more the utility must produce. Another option is to purchase green tags, which allow purchasing the environmental benefits of renewable energy separately from the electricity itself.

Proposed Actions: Create a program that educates citizens and possibly gives them incentives to purchase electricity from renewable sources.

CO₂e Reductions: 24,299 metric tons of CO₂e, 20.47% towards 2012 reduction target

Department: Public Works Department

Strategy C: Build renewable energy infrastructure to replace existing fossil fuel infrastructure

Action Items

- **Electric vehicle infrastructure**

Description: Electric (EVs) vehicle drive trains are much more efficient than the drive trains used on standard internal combustion engine vehicles. Electric motors, rather than pistons and shafts, provide necessary propulsion. EVs use regenerative braking to capture and reuse the energy of the vehicle's momentum in stop-and-go traffic, greatly increasing their efficiency in city driving. One way to encourage electric vehicle use is to construct parking spaces in large parking structures that are reserved for electric vehicles and have a charging connection.
www.betterplace.com

Proposed Actions: Install electric car outlets in city-owned parking garages.

CO₂e Reductions: 36 metric tons of CO₂e, 0.03% towards 2012 reduction target (assumes 15 vehicles)

Goals: Infrastructure for electric cars, less air pollution, lower GHG emissions

Climate Action – Renewable Energy

Cost: Possible partnership opportunities with local/regional utilities.
Department: Transportation Department, Central Services

EDUCATION

GOAL: EDUCATE COMMUNITY ON CLIMATE CHANGE AND ITS EFFECTS

Strategy A: Increase the public involvement and commitment to fighting climate change

Action items

- **Re-launch Cloud 9 program**
Proposed Actions: Re-launch the Cloud 9 program for Annapolis-area schools and residents.
CO₂e Reductions: 878 metric tons of CO₂e, 0.74% towards 2012 reduction target (assumes 1,000 homes reached)
Goals: Cleaner air, lower GHG emissions, increased public participation
Timeframe: Short-term
Cost: New materials - \$7,500
Department: Department of Neighborhood & Environmental Programs
- **Environmental Stewardship Program**
Proposed Actions: Continue creating program that will give a green certification (and accompanying logo) to businesses and residents who take actions to become more sustainable and to lower their carbon footprint.
CO₂e Reductions: 2045 metric tons of CO₂e, 1.73% towards 2012 reduction target (assumes 100 businesses reached, 1,000 residents)
Goals: More green businesses, lower GHG emissions
Timeframe: Short-term
Cost: Outreach materials – Printing and design
Department: Department of Neighborhood & Environmental Programs, Department of Economic Affairs
- **Assist with outreach to faith-based communities, utilize “Cool Congregations” GHG emissions tool**
Proposed Actions: Get churches and other faith-based communities on-board with the Sustainable Annapolis program so that they will help educate their followers about the importance of leading a sustainable lifestyle and lowering their carbon footprint. A new church greenhouse gas emissions inventory tool can be utilized to determine the church with the lowest footprint.
CO₂e Reductions: 389 metric tons of CO₂e, 0.33% towards 2012 reduction target (assumes 50 participating churches)
Goals: Increased public participation, lower community carbon footprint
Timeframe: Short-term
<http://www.coolcongregations.com/?tr=y&auid=4143828>
Department: Office of Youth & Community Affairs
- **Public education about climate change**
Proposed Actions: Create materials to help educate citizens about climate change so that they can take more effective action and understand the problem.
CO₂e Reductions: 878 metric tons of CO₂e, 0.74% towards 2012 reduction target (assumes 1,000 homes reached)
Goals: Greater citizen understanding about climate change challenge, lower city GHG emissions
Cost: Educational materials
Department: Department of Neighborhood & Environmental Programs, Public Information Office
- **Create a database for environmental events occurring in the area**
Description: Creating a conglomerate calendar will allow the public to see the wide array of environmental initiatives that the City and others are undertaking. This may encourage the public to participate in environmental events.
Proposed Actions: Provide a webpage available to the public that contains environmental lectures, demonstrations, tours, etc. in calendar form.
CO₂e Reductions: Depends on events
Goals: Increase community awareness. Increase environmental activity involvement
Timeframe: Mid-term
Department: MIT/Public Works/Department of Neighborhood & Environmental Programs

Strategy B: Educate public employees and government about climate change issues

Action items

- **Incorporate sustainability education in employee orientation and provide incentives**
Description: Educating employees about sustainability will help to encourage them to alter their practices and to take the initiative to come up with ways to improve other city practices. New ideas can be awarded with some sort of incentive developed by the department.
Proposed Actions: Educate new and existing employees about what sustainability is, what the Sustainable Annapolis program is about, and introduce them to the green purchasing practice.

Climate Action – Education

Goals: Increase employee awareness about sustainability issues, greater compliance/awareness of green purchasing policy, more employee sustainability initiatives

Timeframe: Short-term

Department: Human Resources

- **Investigate Carbon footprint of construction and heavy equipment**

Suggestion received from the public

Proposed Actions: Expand the city's carbon inventory to include the footprint of construction taking place in Annapolis, and the footprint of heavy equipment used within the City.

Goals: More accurate emissions baseline

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

WASTE

GOAL: ZERO WASTE

Strategy A: Increase recycling rate

Action items

- **Mandatory public event recycling**

Proposed Actions: Make it mandatory that all public (government) events provide recycling for attendees.

CO₂e Reductions: 1622 metric tons of CO₂e, 1.36% towards 2012 reduction target (assumes 50 lbs per person diverted in a year)

Goals: decreased amount of waste at public events

Timeframe: Short-term

Costs: Additional supplies (bins, etc.) and collection costs

Department: Office of the mayor

- **Recycling program promotion**

Description: When organic matter like wood, paper, food, and yard wastes is placed in landfills, it decomposes anaerobically, producing methane. Methane is a GHG 21 times as powerful as carbon dioxide. Recycling organic materials, like newspapers, other paper, and cardboard, prevents these emissions. Recycling takes less energy than producing products from raw materials, saving emissions from producing that energy. Recycling can generate jobs at recycling facilities and pickup, reduces demand for limited natural resources used to manufacture products.

Proposed Actions: Launch public information campaign. Utilize brochures, emphasis on website, mailers.

CO₂e Reductions: 7,006 metric tons of CO₂e, 5.90% towards 2012 reduction target (assumes doubling of recycling rate)

Goals: Increase recycling rate, lower waste

Timeframe: Short-term

Cost: Outreach materials & mailing costs

Department: Department of Neighborhood & Environmental Programs, Public Works Department

- **Commercial recycling program**

Suggestion received from the public

NOTE: Legislation pending

Proposed Actions: Investigate feasibility of city-run business recycling program

CO₂e Reductions: 19,462 metric tons of CO₂e, 16.40% towards 2012 reduction target

Goals: Expand recycling program to businesses, decreased amount of waste

Timeframe: Mid-term

Department: Public Works Department, Department of Neighborhood & Environmental Programs

- **Better utilize/advertise City Dock recycling capabilities**

Suggestion received from the public

Proposed Actions: Inform visitor's center of the City Dock recycling capability, put signs on the trash cans, and inform boaters who arrive. Install trash cans next to the recycling containers to prevent trash from being thrown in with the recycling.

NOTE: Additional facilities are being installed at this time.

CO₂e Reductions: Minimal

Goals: Reduced waste volume

Timeframe: Short-term

Cost: Signs and boater information - \$2,000; additional trash cans and recycling containers

Department: Harbor Master's Office, Public Works Department, Recreation and Parks

- **More recycling containers at public areas and facilities**

Suggestion received from the public

Description: DPW has placed recycling compactors in the City Dock/Alex Haley Park area, and has worked with Central Services to have containers placed in City buildings. A survey would help to indicate what facilities and public areas are in need of more recycling containers.

Proposed Actions: Add recycling containers or retrofit old trash cans to have accompanying recycling container. Initiate trial program to install more recycling containers at city parks, ball fields, boat ramps, tennis courts, etc. A survey will need to be conducted of the container contents to determine if there are enough recyclables for containers to be feasible for pickup. If there are no bins, require organizers who use the facilities to recycle. Ensure that all recycling containers have an accompanying trash can to limit trash that ends up in the recycling container. Regular and centralized pickup should be performed for all recycling containers in the city.

CO₂e Reductions: 1622 metric tons of CO₂e, 1.36% towards 2012 reduction target (assumes 50 lbs per person diverted in a year)

Goals: Increased public recycling, less waste produced

Timeframe: Short-term

Cost: ~\$100 per container

Department: Public Works Department, Recreation & Parks Department

Climate Action – Waste

- **Reduce trash pickup to once a week to increase recycling**

Suggestion received from the public

Description: Many people today are producing a higher volume of recyclable materials than they are of disposable waste each week. A change in the pickup schedules could promote more recycling or reduce pickup costs.

Proposed Actions: Reduce trash pickup where possible to once a week, and increase recycling pickup days to twice a week (*Not recommended by staff*). Another option could be decreasing pickup of both to only once a week.

CO₂e Reductions: 7,006 metric tons of CO₂e, 5.90% towards 2012 reduction target (assumes doubling of recycling rate)

Goals: Increased recycling, decreased waste production

Timeframe: Mid-term

Department: Public Works Department

- **Central drop-off for waste & recycling**

Suggestion received from the public

Proposed Actions: Create a central area in the city where people can drop off recycling. Another option is to promote a central drop-off area---such as the county site in Millersville---for refuse, recycling, bulk trash, and hazardous waste.

CO₂e Reductions: Minimal

NOTE: DPW has had a waste consultant investigate this option, and a new property may need to be located and equipped for this activity.

Goals: efficiency and ease-of-use for citizen waste & recycling disposal

Costs: New facility needed, operation and maintenance

Department: Public Works Department

Strategy B: Waste reduction

Action items

- **Pay-as-you-throw program**

Description: Pay as you throw programs provides a financial incentive for people to reduce the amount of waste they generate. Pay as you throw programs encourage recycling, reuse of items, and source reduction, where people may choose items with less packaging, knowing they will have to pay for the disposal of that packaging. When organic matter like wood, paper, food, and yard wastes is placed in landfills, it decomposes anaerobically, producing methane. Methane is a GHG twenty-one times as powerful as carbon dioxide. Reducing the amount of waste going to landfills reduces these emissions. By reducing the amount of waste to be collected, pay as you throw programs can reduce emissions associated with collecting wasted and transporting it to a disposal site, if collection routes are re-optimized for the new amount of waste. The program could be designed to not disadvantage families with a large number of children.

Proposed Actions: Explore the feasibility of creating a 'pay as you throw' program for waste, where residents pay per pound.

NOTE: This program has been considered in the past as an option for Annapolis.

CO₂e Reductions: 16,985 metric tons of CO₂e, 14.31% towards 2012 reduction target (assumes 300 lbs waste diverted per person per year)

Goals: less waste, increased recycling

Costs: Start up costs for containers, new collection management system, billing system, and management of program

Timeframe: Long-term

Department: Public Works Department

- **Install hand dryers in City facilities and City businesses**

Description: Using hand driers instead of paper towels in our restrooms will reduce waste, reduce maintenance costs, and can help to filter the air in the bathrooms. This will all help to create more hygienic restroom facilities available to City staff and residents. Modern hand driers work very quickly, are energy efficient, and can actually filter the air in the restroom with a HEPA filter.

Proposed Actions: Install hand dryers in City facilities. Look into incentive programs for City businesses to convert to hand driers.

CO₂e Reductions: Doesn't directly lower City's emissions

Goals: Less waste

Costs: Hand driers

Department: Central services

<http://www.airefficient.com/air-efficient-products/dyson-airblade/>

<http://www.veltia.com/eng/index.htm>

- **Promote yard waste composting program**

Suggestion received from the public

Description: When organic matter like wood, paper, food, and yard wastes is placed in landfills, it decomposes anaerobically, producing methane. Methane is a GHG 21 times more powerful than carbon dioxide. Composting yard waste rather than sending it to landfills prevents these emissions. Yard waste composting provides fertilizer for local farms or gardens. This fertilizer does not have to be produced from fossil fuels. Annapolis currently has a yard waste composting program.

Proposed Actions: Promote a citizen home composting program and investigate starting a city program to pickup compostables once a week in approved, sealed containers. Increase yard waste recycling.

CO₂e Reductions: Increased yard waste recycling – 592 metric tons of CO₂e, 0.50% towards 2012 reduction target (assumes 75 lbs diverted per person per year)

Goals: Less waste produced

Timeframe: Short-term

http://www.sfenvironment.org/our_programs/interests.html?ssi=7&ti=6&ii=17

Climate Action – Waste

Department: Public Works Department, Recreation & Parks Department

- **Curb-side composting program**

Suggestion received from the public

Description: The city currently composts yard waste. Public input has urged for a feasibility study for a curbside composting program. An alternative to a curbside program could be a promotion of the city's existing composting program, in addition to encouraging residents to compost on their own. When organic matter like wood, paper, food, and yard wastes is placed in landfills, it decomposes anaerobically, producing methane. Methane is a greenhouse gas with 21 times the impact on temperature as the same amount of carbon dioxide. About 12% of municipal solid waste is food scraps, and another 12% is yard waste. Collecting and composting this organic waste prevents the emissions it would have produced in the landfill. Composting produces fertilizer that can be used for farms or gardens, returning to the soil the nutrients removed with food production. Composting reduces the volume of material sent to landfills, reducing disposal costs. San Francisco offers curbside waste collection with three equal sized bins: recycle, compost, and trash, resulting 67% of waste being diverted from landfills in 2004.

Proposed Actions: Promote a citizen home composting program and investigate starting a city program to pickup compostables once a week in approved, sealed containers. Increase yard waste recycling.

CO₂e Reductions: Curbside composting program – 3,108 metric tons of CO₂e, 2.62% towards 2012 reduction target (assumes 300 lbs diverted per person per year)

Goals: Less waste produced

Costs: For a City-run composting program costs may be: approved, sealed containers; associated collection and process costs

Timeframe: Mid-term

http://www.sfenvironment.org/our_programs/interests.html?ssi=7&ti=6&ii=17

Department: Public Works Department, Recreation & Parks Department

OTHER CARBON REDUCTION STRATEGIES

GOAL: COMPREHENSIVE REDUCTION OF GREENHOUSE GAS EMISSIONS IN THE CITY

Strategy A: Cross-cutting carbon reduction strategies

Action items

- **Implement 4-day work week**

Description: A 4-day work week has been implemented by Utah government workers, and more locally by Howard County government. The shorter work weeks, with four 10-hour days, can lower greenhouse gas emissions by having one day less of commuting. In addition, the commuting employees would be traveling during non-peak hours, helping to lower road congestion.

Proposed Actions: Implement a 4-day work week where possible.

CO₂e Reductions: 220 metric tons of CO₂e, 6.76% towards 2012 reduction target (assuming applies to 450 employees)

Goals: Improved city air quality, lower GHG emissions, less transportation and energy use

Timeframe: Mid-term

Departments: Human Resources

- **“Live where you work” incentive program**

Description: If residents live and work in Annapolis, there will be less commuting and less greenhouse gas emissions. Incentives could include tax breaks, discounts at local businesses, discounts on new homes or mortgages, or monthly rental discounts.

Proposed Actions: Create a “live where you work” incentive program.

CO₂e Reductions: 122 metric tons of CO₂e, 0.10% towards 2012 reduction target (assumes 50 residents participate)

Goals: Less commuting, cleaner air, lower greenhouse gas emissions

Timeframe: Mid-term

Departments: Department of Neighborhood & Environmental Programs, Office of the Mayor

- **Create “Anna Pass” carbon off-set program**

Description: Using a carbon off-set program such as Terra pass, Annapolis can setup a program called “Anna pass” where citizens can purchase carbon off-sets from the city. The funds would go to our own climate action programs and to a non-profit similar to Terra Pass where the city could purchase carbon offsets.

Proposed Actions: Create “Anna Pass” program using terra pass (or similar carbon off-set program). City can raise some funds for our own climate action through this program.

CO₂e Reductions: Varies

Goals: Raise funds for city climate action, Lower GHG emissions, increased public participation

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Install anaerobic digester at wastewater treatment facility**

Description: Anaerobic digestion uses bacteria in an anaerobic (without oxygen) environment to breakdown organic matter. The process produces methane that can be used as a renewable energy source. It also reduces the amount of organic matter sent to landfills, reducing methane emissions from landfills. Methane is 21 times more powerful as a GHG than carbon dioxide.

Proposed Actions: Investigate the possibility of installing anaerobic digester at the wastewater treatment facility.

CO₂e Reductions: 12,543 metric tons of CO₂e, 383.88% towards 2012 reduction goal (assumes 37,000 people served)

Department: Public Works Department

- **Investigate local carbon tax/fee**

NOT RECOMMENDED BY CITY STAFF

Suggestion received from the public

Description: A carbon tax can be a way to pay for emissions reduction efforts. A tax on carbon or energy use makes sense as a way to fund these efforts because taxed sales and services are directly linked with such programs. A carbon tax can be implemented as a tax on utility bills, based on the amount of energy used. Another option is to tax builders of new homes, based on the carbon emissions the home is projected to be responsible over its lifetime. The second option is more likely to instigate the desired response--changes in energy use. While carbon taxes have been proposed at the federal level primarily to discourage emissions, the primary purpose of local carbon taxes (that have been implemented so far) is to raise funds for emissions reduction projects. More comprehensive carbon taxes (e.g. transportation sector) and taxes that reflect the full societal cost of GHG emissions may have too high an implementation cost to be enacted at a local level, and communities worry that a tax that significantly raises energy costs will cause businesses and residents to move elsewhere.

Aspen, CO's Renewable Energy Mitigation Program charges homebuilders a fee based on projected excess carbon emissions of the home over 20 years. Homes are allowed 40,000 Btu/ft² each year, an amount calculated to be achievable with cost-effective efficiency measures in the local mountain climate. A home design expected to use more than that must pay \$340 per ton of carbon emitted over the next 20 years. Homes larger than 5,000 ft² must either install a solar energy system (electric or hot water) or pay a \$5,000 fee. The fees raised \$1.5 million in the first two years, and \$667,000 of that had been spent on projects saving 12,000 tons of carbon emissions. For more information, see: <http://www.grist.org/news/maindish/2002/07/31/clifford-remp/>

Proposed Actions: Setup a committee to investigate the feasibility of implementing a carbon tax modeled after the Aspen, CO example.

CO₂e Reductions: 37,000 metric tons of CO₂e, 31.00% towards 2012 reduction target (based on Aspen Colorado estimates)

Goals: Lower GHG emissions

Timeframe: Short-term

Department: Office of the mayor

ENVIRONMENT



WATER QUALITY

GOAL: CLEAN WATER AND HEALTHY WATERSHEDS THAT SUPPORT THE AQUATIC LIVING RESOURCES OF THE BAY, ALLOW FOR RECREATIONAL OPPORTUNITIES, AND PROTECT HUMAN HEALTH.

Strategy A: Reduce nutrients resulting from residential actions

Action items

- **Encourage citizens to measure their nitrogen footprint**

Goals: Cleaner bay, fewer dead zones, citizen action

Proposed Actions: CBF recently released a website that allows residents to calculate their nitrogen footprint. This can be encouraged by DNEP. Awards could be given to the community that has the highest percentage of residents who participate.

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

- **Pet waste education**

Proposed Actions: Increase the number of pet waste receptacles in the city parks, and incorporate some new signage to help educate animal owners about the impact their pet's waste can have on the water quality of our local creeks.

Goals: Improved public health

Costs: Pet waste receptacles, outreach materials

Timeframe: Mid-term

Department: Recreation & Parks Department

Strategy B: Reduce contaminants entering the Bay

Action items

- **Road salt reduction or replacement**

Description: Road salts and other de-icing chemicals are used to lower the freezing point of road surface water and ice. Common salt (sodium chloride) is often used, but when pavement temperature drops to -12oF, the use of calcium chloride is often applied. Environmental damage can be a consequence of the over-application of salts and other chemicals during snow and ice storms as well as salt storage. Soils, vegetation, water, highway facilities, and vehicles are all affected by salt application. Road salt is known to have run-off and contributed to an increase in the amount of salt in our drinking water supply, and is also known to impact the development of amphibians and fish. Reducing or replacing road salts by combination application can reduce the impacts on the surrounding wildlife and Chesapeake Bay Environment. One possible alternative to road salt is sand, which will not impact the environment or cause corrosion.

Proposed Actions: Investigate alternatives to road salt to determine if reduction or replacement with sand is possible.

Goals: Healthier wetlands and Bay, less salt in our drinking supply, less property damage

Time Frame: Short-term

http://www.mass.gov/Eoeea/docs/eea/water/farmington_road_salt_review.pdf http://ntl.bts.gov/DOCS/HS-041_382/017-030.pdf

http://weblogs.baltimoresun.com/news/local/bay_environment/blog/2009/03/icy_dilemma_road_salt_taints_s.html

- **Install turf reinforcement technology at the Naval stadium parking lot**

Description: The grassy parking area around the Naval stadium is currently not reinforced, which causes the grass to die, and the area to get muddy after large events. To prevent sediment from entering the bay, and to lower the maintenance on the grass, the area should be reinforced. Reinforcing technology includes geo-grids and geotextile matting that is laid down and then re-seeded or sodded, or it could be reinforced with a metal wire. These methods help to prevent soil compaction and prevent the grass from dying.

Proposed Actions: Install a vegetated reinforcement technology in the Naval stadium's pervious parking lots.

Goals: Improved water quality, less sediment entering the bay, less maintenance cost

Time Frame: Short-term

- **Install turf reinforcement technology (such as geotextile grid or metal wire) at the Naval stadium parking lot**

- **Proper management of oil, sand, and salt storage**

Suggestion received from the public

Proposed Actions: Work with local businesses so they properly manage oil, sand, and salt storage. Educational materials should be used. Investigate code changes if necessary.

Goals: Cleaner water

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Establish Illicit Discharge Detection & Elimination outfall tracking program**

Suggestion received from the public

Description: An Illicit Discharge Detection & Elimination (IDDE) tracking program would identify sources of illegal discharges, setup a hotline for people to report problems, set program goals and strategies, implement the strategies, search for illicit discharge, isolate and fix problems, and monitor the outfalls for problems. Potential sources of illicit discharges could be sanitary wastewater, effluent from septic tanks, car wash wastewaters, improper oil disposal, radiator flushing disposal, laundry wastewaters, spills from roadway accidents, or improper disposal of auto and household toxics.

Proposed Actions: Establish an IDDE outfall tracking program for the city.

Goals: Cleaner water

Timeframe: Mid-term

<http://www.ecy.wa.gov/programs/wg/Stormwater/municipal/GISpresentations/09SingelisIDDEProgrammaticImplementation.pdf>

Department: Department of Neighborhood & Environmental Programs

- **Good housekeeping at City facilities**

Suggestion received from the public

Description: Lead by example at the government level. Establish good house-keeping measures at the city DPW yards, bus yards, etc.

Proposed Actions: Ensure that DPW property is properly cleaned, maintained, and that any hazardous materials are stored and disposed of properly.

Goals: Cleaner water

Timeframe: Short-term

Department: Public Works Department

- **Campaign to educate people about littering**

Suggestion received from the public

Proposed Actions: Help to educate citizens about the litter laws and make them aware that cigarette butts are considered litter.

Install a few ash trays downtown that are compliant with the historic preservation commission. Institute a \$10 fine for people who litter butts.

Goals: cleaner city

Costs: Purchase of HPC-approved ash containers, collection of waste

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs, Public Works Department

- **Ban coal-tar sealant use in City**

Suggestion received from the public

Description: Coal-tar sealant contains Polycyclic Aromatic Hydrocarbons (PAHs). PAHs are a chemical contaminant found in parts of the Bay watershed. As more areas of the watershed are developed, levels of PAHs in the Bay and its tributaries are increasing, potentially causing negative health effects in humans and wildlife. Coal-tar sealant is believed to have contributed to the cancerous lesions found on South River fish.

In water, PAHs attach to sediment, impacting bottom-dwelling organisms like oysters, plankton and some species of fish. As these organisms spend time in or near contaminated sediments, they accumulate PAHs in their tissues. PAHs are suspected to cause cancerous tumors in fish, particularly in bottom-dwelling species. Humans can be exposed to PAHs through ingestion, inhalation and skin contact, as well as eating contaminated fish.

PAHs have been shown to cause cancerous tumors in animals, even in single doses. Non-cancerous health effects are not well understood, but can include immune system suppression and red blood cell damage. In other organisms, such as fish and invertebrates, adverse health effects have included:

- * Cataracts
- * Fin erosion
- * Liver abnormalities
- * Inhibited reproduction
- * Death

Proposed Actions: Ban or limit the use and sale of coal-tar sealant in the City

Goals: Clean water

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

<http://www.pottsmmerc.com/articles/2009/03/02/news/srv0000004789373.txt>

<http://www.chesapeakebay.net/pahs.aspx?menuitem=19500>

Strategy C: Reduce amount of stormwater run-off entering the Bay---promote infiltration

Action items

- **Rain garden maintenance education, funding, and bond extension**

Proposed Actions: Educate the public about the importance of maintaining any rain gardens or bio retention areas on their property.

Goals: Improved water quality

Timeframe: Short-term

Department: Planning & Zoning Department, Department of Neighborhood & Environmental Programs

- **Green right-of-way program**

Goals: Increased aesthetics, cleaner water, heat reduction, energy efficiency

Proposed Actions: Provide or seek funding opportunities for residents and businesses who want to participate in an Annapolis Green Alley and right-of-way program. This program will seek to beautify and increase the sustainability of the right-of-ways. Specific improvements could include installing pervious pavement, installing energy efficient lighting, installing native vegetation and rain gardens, naturalized detention areas, and rain barrel installation.

Timeframe: Mid-term

Cost: Rain Garden - \$3-\$6 per square foot
Rain barrel/cistern - \$10-\$50,000
Permeable pavement - \$3-\$15 per square foot
Energy efficient/dark sky lighting - \$200-\$5,000 each
Naturalized detention area - \$.07-\$.14 per square foot
Bioswales and vegetated swales - \$8-\$30 per linear foot

Department: Public Works Department

- **Green wall/façade and art program**

Description: A green wall is either free-standing or part of a building that is partially or completely covered with vegetation and, in some cases, soil or an inorganic growing medium. Living walls are particularly suitable for cities, as they allow good use of available vertical surface areas. They help to clean air, prevent urban heat island affect, and can be connected to existing water and air systems to act as filters. They are often built by adding a grid system---already containing the vegetation---to the outside of an existing wall.

Proposed Actions: Turn some city-owned walls into green walls in the hopes of encouraging other wall-owners and businesses to follow suit. Consult with the Art in Public Places Commission as a launch point to move this forward.

Goals: Cleaner air, cleaner water, cooler temperature, improved aesthetics

Timeframe: Mid-term

http://www.eltlivingwalls.com/photo_gallery.php

Department: Department of Neighborhood & Environmental Programs

- **Pervious pavement for roads, parking lots, and sidewalks**

Description: Many other jurisdictions have or are currently studying the feasibility of using porous pavement in parking lots and roadways. Instead of conducting our own trial, review what other cities have done to determine if porous pavement is a technology that Annapolis can and should utilize. If it is adequate, porous pavement could be promoted for use in converting large paved parking lots in to pervious lots. Sidewalks contribute to the City's impervious surface. If they were to allow more infiltration they could act as more of a barrier to intercept stormwater runoff.

Proposed Actions: Review pervious pavement trials conducted by other cities to determine if it is something Annapolis can utilize.

Goals: Cleaner water, less impervious surfaces, more infiltration

Timeframe: Short-term

Department: Public Works Department, Department of Neighborhood & Environmental Programs

- **Promote reduction of pesticide & herbicide usage & utilize integrated pest management instead**

Suggestion received from the public

Proposed Actions: Develop a program for local landscaping companies and residents that promotes using less pesticides and herbicides if there is a reasonable integrated pest management alternative available.

Goals: improved water quality, increased soil health

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

Strategy D: Repair & retrofit failing stormwater outfalls

Action items

- **Study opportunities for day-lighting streams or installing regenerative stormwater systems in city**

Description: Day-lighting streams and installing regenerative storm-water systems helps to prevent soil erosion associated with piping streams (which causes increased water velocity), creates habitat, creates recreation areas, promotes groundwater aquifer recharge, prevents eutrophication of the water by cooling the water down (rather than being heated by pavement), and creates healthier wetlands.

Proposed Actions: Perform a comprehensive study identifying sites in the city suitable for day-lighting or installation of regenerative storm-water designs.

Goals: Cleaner water, Less piped streams = better water quality and a recharged ground water supply

Timeframe: Long-term

Costs: Study

Might be able to use money from the Storm-water Utility account

Department: Public Works Department

- **Stormwater utility update**

Suggestion received from the public

Description: Annapolis is the only city in the area that has a stormwater utility. Residents and businesses pay a fixed fee on their water bill.

Proposed Actions: Investigate increasing the fee and having it be based on your square footage of impervious surfaces.

Goals: Cleaner water, less impervious surface

Timeframe: Short-term

Department: Public Works Department

- **Business-city partnership for stormwater management**

Suggestion received from the public

Proposed Actions: Work with local businesses to improve stormwater management on their property.

Goals: Cleaner water

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

NATURAL RESOURCES

GOAL: PRESERVE, PROTECT, AND RESTORE THE HABITATS AND NATURAL AREAS OF ANNAPOLIS

Strategy A: Improve health of watersheds

Action Items

- **Native landscaping**

Description: Native plants provide more habitat for wildlife, require less watering, and create healthier soils. There are some non-native plants that kill native fungus in the soil that trees rely on for sustenance, or that alter the pH of the soil.

Proposed Actions: Promote the preference of using native plants for local landscaping rather than non-native exotic species.

Goals: Increased habitat value, lower water use

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Annapolis Watershed Study**

Proposed Actions: Help to implement the recommendations laid out in the Annapolis Watershed Study

Goals: Cleaner water, improved recreational opportunities

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

- **Living shoreline program**

Description: Many shorelines today are no longer in their natural state, and are instead armored with bulkheads, rip-rap, or an assortment of jetties. "Living Shorelines" are shorelines that have been restored to their natural state in an effort to have more effective erosion control, increased habitat value, more flood control, and storm water management that will promote more infiltration and healthier water. "Living Shorelines" often allow for natural coastal processes to remain through the strategic placement of plants, stone, sand fill and other structural and organic materials. Maryland is at the forefront of developing "living shorelines" projects, and many can already be seen in the Chesapeake Bay region.

Proposed Actions: Create a Living Shoreline Program that is modeled after the EZ program.

Goals: Improved water quality, wildlife habitat restoration

Time Frame: Mid-term

Cost: Grant funding, financial assistance (<http://shorelines.dnr.state.md.us/financial.asp#srp>)

<http://shorelines.dnr.state.md.us/living.asp>

- **Prioritize a creek or watershed for restoration efforts**

Suggestion received from the public

Description: Prioritize restoration efforts on a single body of water in the city to act as a case study for what could be accomplished.

Proposed Actions: Take focused restorative action on a single body of water in the city.

Goals: improved water quality

Timeframe: Long-term

Department: Department of Neighborhood & Environmental Programs

Strategy B: Increase tree canopy from 42% to 50% by 2030

Action Items

- **No net-loss for tree canopy**

Description: Trees help to increase community aesthetics, clean our air, clean our water, and prevent urban heating from occurring.

Proposed Actions: Set a goal for no net-loss of trees in the city. Explore steps that P&Z can take to help the city achieve this goal.

Continue to enforce Annapolis Codes 14.12 and 17.09.

Goals: Improved public health, cleaner air

Timeframe: Short-term

ENVIRONMENT — CHESAPEAKE BAY

Department: Planning & Zoning Department, Department of Neighborhood & Environmental Programs

- **Partnerships with local businesses**

Description: Local businesses can help to donate trees for the City and residents to plant in targeted areas, or to donate space where trees can be planted.

Proposed Actions: Develop partnerships with local businesses that are interested in supplying trees or planting space.

Goals: Cleaner air, improved aesthetics

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

- **Neighborhood by neighborhood approach**

Description: One approach to increasing the City's tree canopy is to inventory neighborhoods that are in need of greater canopy coverage, and focus a large portion of the City's planting efforts in that area. This helps to create dense canopies as a result of our plantings, rather than spreading trees all throughout the City.

Proposed Actions: Implement a neighborhood by neighborhood approach to tree plantings. It may be necessary to conduct an inventory of neighborhoods to determine which ones are in need of greater canopy coverage.

Goals: Cleaner air, improved aesthetics

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

- **Continue offering tree giveaways**

Description: The City currently holds tree giveaways each fall for interested residents. This helps to encourage home owners and community members to plant trees where they desire, free at charge.

Proposed Actions: Continue offering annual, fall tree giveaways.

Goals: Cleaner air, improved aesthetics

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

- **Pursue applicable grants**

Description: There are many tree-related grants available from groups such as the Chesapeake Bay Trust, which the City should pursue. It would also be helpful to work with organizations within the City that have received such grants, for example the Spa Creek Conservancy and the Alliance for the Chesapeake Bay, to ensure that they plant some of their trees in areas that are in need of a greater canopy coverage.

Proposed Actions: Pursue grants for the City to increase its tree canopy and work with City groups who receive such grants.

Goals: Cleaner air, improved aesthetics

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

- **Conduct community outreach**

Description: Community outreach is an important part of our effort to increase our tree canopy. Some of the property in the City is owned and maintained by Homeowner Associations (HOA). The City should hold a seminar to educate the HOAs about responsible landscaping and correct tree care/maintenance. In addition, the City and local Tributary Team can prepare a booklet that helps to educate residents about trees. Lastly, we can outreach to community newsletters and newspapers.

Proposed Actions: Hold a seminar for HOAs, prepare an educational booklet with the local Tributary Team about trees, and write an article for the Capital newspaper.

Goals: Cleaner air, improved aesthetics

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **10-year remote sensing progress reports**

Description: It was recommended in the *Annapolis Urban Tree Canopy Report* that the City work with MD DNR to conduct a remote sensing assessment every 10 years to monitor our progress on achieving our canopy coverage goal.

Proposed Actions: Conduct remote sensing assessments of our canopy coverage progress every 10 years (2016, 2026).

Goals: Greater tree canopy coverage, effective strategy for increasing our tree canopy coverage

Timeframe: Long-term

Department: Department of Neighborhood & Environmental Programs

- **Urban Tree Canopy implementation plan**

Description: It was recommended in the *Annapolis Urban Tree Canopy Report* that the City work with MD DNR Forest Service and the Chesapeake Bay Program to develop an implementation plan to realize the UTC goal. Whenever areas are annexed, the report should be updated within six months of the availability of digital shape-files for the 3 new ward boundaries.

Proposed Actions: Work with MD DNR Forest Service and the Chesapeake Bay Program to develop an implementation plan to realize the UTC goal. Update this report within six months of any annexation (depending on availability of the shape files).

Goals: Greater tree canopy coverage, effective strategy for increasing our tree canopy coverage

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Create separate multi-year bonds for trees**

Description: Currently, trees are covered by the maintenance bonds, which generally are released after one year. Trees that have been damaged by construction activities can take anywhere from 1-3 years to show any resulting damage, often times after the maintenance bond has been released. An alternative would be to have separate bonds for trees or groups of trees that are only released after a longer period of time (2-5 years).

Proposed Actions: Take steps to allow for separate and longer bonds for trees.

Goals: Healthier tree canopy, cleaner air

Timeframe: short-term

Department: Department of Neighborhood & Environmental Programs

- **Improved street-scaping and more vegetated medians**

Suggestion received from the public

Description: Planting more vegetation and trees along our streets and sidewalks can help to slow down traffic, improve aesthetics, and lead to cleaner air. Installing vegetated medians in our roadways can help to improve aesthetics, reach our urban tree canopy goal, and help to clean up our air.

Proposed Actions: Improve street-scapes along city roads by planting more vegetation and trees. Install more vegetated medians.

Goals: Cleaner air, improved aesthetics, improved stormwater management

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs, Public Works Department

LAND USE

GOAL: DEVELOP, PROMOTE, AND ACHIEVE SOUND LAND USE PRACTICES WHICH PROTECT AND RESTORE THE WATERSHED RESOURCES, WATER QUALITY, AND OTHER NATURAL RESOURCES OF ANNAPOLIS

Strategy A: Implement transportation practices that move away from more road construction and expansion and lesson the negative environmental impacts of existing roads

Action Items

- **Transportation demand management**

Description: Transportation demand management or travel demand management (both TDM) is the application of strategies and policies to reduce automobile travel demand, or to redistribute this demand in space or in time. In transport as in any network, managing demand can be a Cost-effective alternative to increasing capacity. A demand management approach to transport also has the potential to deliver better environmental outcomes, improved public health and stronger communities, and more prosperous and livable cities. The techniques of TDM, applied by government transport agencies, link with and support community movements for sustainable transport.

Proposed Actions: Start using TDM in road planning and site development. Develop policies allowing for a percentage of trips generated to be accounted for using alternative transportation (i.e. add bus stops and bike lockers).

Goals: less need for road expansion, cost savings, less congestion, cleaner air

Timeframe: Long-term

Department: Planning & Zoning Department

- **Set standards for environmentally-friendly city roads**

Suggestion received from the public

Description: Roads have a number of detrimental effects on the environment. They heat up stormwater runoff, fail to filter the water, destroy habitat, disrupt migration patterns, destroy aesthetics, contribute noise, and lead to increased air pollution. To help lessen these detrimental effects, standards should be adopted for any new road construction or road expansion. In addition, a fund should be established to lesson the impact of older roads. Some examples of the standards could be the following: provide wildlife corridors for reptiles, amphibians, and mammals (eco passages); install vegetated medians and shoulders to help filter and cool any run-off; implement state-of-the-art stormwater management for roads; or constructing noise walls in residential areas.

<http://www.lakejacksonturtles.org/>

Proposed Actions: Create environmental standards for new road construction and road expansions. Establish a fund to help renovate/retrofit old roads to lesson their environmental impact.

Goals: Cleaner water, improved habitat

Timeframe: Mid-term

Department: Planning & Zoning Department, Transportation Department, Public Works Department

Strategy B: Open space preservation and connectivity

Action Items

- **Link city greenways with county greenways**

Proposed Actions: Greenways are corridors of forested habitat that provide ecological benefits to wildlife and humans. Wildlife benefits from having habitat that allows them to travel longer distances, and humans benefit by having more contiguous areas for recreation. Currently, there are two existing recreational greenways that are located in Annapolis. With 13 existing and proposed Anne Arundel County greenways, connecting Annapolis to them will bridge the gap between the wildlife corridors,

ENVIRONMENT – CHESAPEAKE BAY

and it will also provide Anne Arundel County residents with safe and scenic routes between the City and the County.

The *Maryland Atlas of Greenways, Water Trails and Green Infrastructure* lists a number of greenways that could be established between the City and County. One recreational greenway that could be developed is the South River Greenway that could link Crownsville State Hospital, the Anne Arundel County Fairgrounds, the Dwight D. Eisenhower Golf Course, the Annapolis City Waterworks Park, Broad Creek Park, Annapolis Senior High School, and Camp Woodlands (along North Basin and Broad Creek). Another county-to-City recreational greenway is the South Shore Trail that would run between Odenton and Bestgate Road in the City.

Goals: More wildlife corridors, higher habitat value

Timeframe: Mid-term

Department: Planning & Zoning Department

- **Conservation easement maintenance**

Description: Some of the city conservation easements may have problems with invasive species, stream erosion, or failing stormwater management. Periodic inspections will help to find any problems that need to be addressed.

Proposed Actions: Regularly monitor the city's conservation easements to determine if any maintenance is required.

Goals: Improved water quality

Timeframe: Short-term

Department: Planning & Zoning Department, Department of Neighborhood & Environmental Programs

Strategy C: Public access to our natural resources

Action Items

- **Create small green spaces/pocket parks throughout the city**

Suggestion received from the public

Proposed Actions: Search for places in the city that can be converted or used as public open space parks for people to relax and recreate.

Goals: Improve public health

Timeframe: Short-term

Costs: Trash Barrels

Department: Planning & Zoning Department

Strategy D: Redevelopment and revitalization rather than building on undeveloped land

Action Items

- **Investigate purchasing the old state police barracks for public use**

Suggestion received from the public

Description: The old Maryland State Police barracks are now vacant and may be able to be purchased and utilized by the city in some fashion.

Proposed Actions: Investigate purchasing the vacant state police barracks and converting the land to be used for an ecologically-sound purpose.

Timeframe: Mid-term

Department: Office of the mayor

- **Transform the Market House into an open-air market for local produce & food products**

Suggestion received from the public

Proposed Actions: Set long-term goal to transform the Market House into an open-air market for local produce & food products.

Goals: Improve public health, support local economy, lower GHG emissions from shipping food

Timeframe: Long-term

Department: Office of the mayor

AIR

GOAL: IMPROVE AIR QUALITY AND REDUCE CODE RED DAYS

Strategy A: Reduce contributing factors and emissions

Action items

- **Develop policies to enact on code red days**

Description: Code Red days are called when there is a significant threat of unhealthy air due to pollution and weather conditions. People are warned to limit their outdoor activities, with children, senior citizens and asthmatics especially at risk. Ozone is

ENVIRONMENT – CHESAPEAKE BAY

associated with increased asthma attacks, coughing, wheezing, and aggravation of other respiratory illnesses. Higher smog levels in a region are frequently accompanied by increased hospitalization and emergency room visits for respiratory disorders.

Policies that could be implemented include cooling centers, ban on using lawn mowers, taking steps to limit the number of cars on the roads, waving fares on the transit busses, telecommuting promotion, and carpooling incentives.

Proposed Actions: Develop a set of policies to enact on code red days.

Goals: Cleaner air, healthier public

Timeframe: Short-term

Departments: Department of Neighborhood & Environmental Programs

- **Promote fueling and mowing during cooler times of day**

Description: Fueling or mowing during the cooler mornings or evenings can help to cut down on the air pollution that is created during a higher temperature.

Proposed Actions: Promote fueling and mowing during cooler times of day

Goals: Lower emissions, cleaner air

Departments: Department of Neighborhood & Environmental Programs

- **Implement emissions reduction strategies in Climate Action section**

Description: The action items in the Climate Action section of this report will all help to lower not only greenhouse gas emissions, but other emissions that contribute to code red days.

Proposed Actions: Implement action items in Climate Action section.

Goals: Lower emissions, cleaner air

Departments: All

- **Implement urban tree canopy strategies in Environment section**

Description: The action items in the Environment - Urban Tree Cover section of this report will all help to create cleaner air and lower emissions that contribute to code red days.

Proposed Actions: Implement action items in Environment – Urban Tree Cover section.

Goals: Lower emissions, cleaner air

Departments: Department of Neighborhood & Environmental Programs

- **Close parts of downtown to car traffic on weekends**

Suggestion received from the public

Proposed Actions: Close parts of downtown to car traffic on the weekends. Traffic can park at the Riva Road park & ride (empty on weekends) and take a shuttle to downtown.

Goals: Less GHG emissions, cleaner air

Timeframe: Short-term

Department: Transportation Department

ECONOMY



LOCAL ECONOMIC DEVELOPMENT

GOAL: A LOCALIZED ECONOMY THAT PROMOTES LOCAL PURCHASING OF NECESSITIES

Strategy A: Create a local food supply rather than long-distance foods that need to be shipped

Action Items

- **Promote farmers markets and local foods, community supported agriculture, and use of food stamps at these venues**
 - Description: Promoting the purchase of local foods will improve public health, build the local economy, and lower GHG emissions by lessening the distance food must be shipped. The city government has passed a green purchasing ordinance that promotes the purchase of local products and foods.
 - Proposed Actions: Promote local farmers markets, educate consumers about buying local. The city may be able to work with the Conference & Visitor's Bureau.
 - Goals: Strengthen local economy, improve public health
 - Department: Public Information Office
- **Zoning update for urban agriculture/community gardens**
 - Description: In order to allow people to create community gardens and limited urban agriculture, and to be able to sell those goods, it may be necessary to update zoning to allow such a land use.
 - Proposed Actions: Ensure zoning allows for creation of community gardens and limited urban agriculture
 - Goals: Strengthen local economy, improve public health, less GHG emissions
 - Department: Planning & Zoning, Department of Neighborhood & Environmental Programs, Recreation and Parks Department
- **Local food distribution program/facility**
 - Description: Two barriers to utilizing local foods are cost and accessibility. When local products are readily available at competitive prices, the local economy thrives on the free market creating more local jobs.
 - Proposed Actions: Make a "fact sheet" on all externalized costs of food products. Work with other organizations in the community to create a centralized distribution facility for farmers to sell, store, and process their products.
 - Goals: Strengthens local economy, reduces GHG emissions, improved access to local goods
 - Time Frame: Mid-term
 - Cost: outreach materials, facility
 - http://departments.oxy.edu/uepi/publications/TCE_Final_Report.pdf (barriers are three-fold: institutional, farm, and distribution)
 - <http://www.georgiaorganics.org/Files/LFG2007.pdf> (info on local farms and farmers markets)
 - <http://thefoodproject.org/agriculture/Internal1.asp?ID=109>
 - Department: Department of Economic affairs
- **Rooftop garden program**
 - Description: A rooftop garden utilizes previously unused space and transforms it into a vegetated area. Plants are established in soils spread on rooftops of buildings. With volunteer or intern hours, labor costs will be at a minimum.
 - Proposed Actions: Create a rooftop garden program for downtown residents and businesses.
 - Goals: Local food supply, reduce GHG emissions
 - Time Frame: Short-term
- **Help shops cut out the middle-man**
 - Description: Buying directly from a producer helps to cut-out all the emissions, cost, and other waste associated with using a middle-man.
 - Proposed Actions: Identify ways that the City can help local producers sell their goods directly.
 - Goals: Local food supply, reduce GHG emissions
 - Time Frame: Mid-term
 - Department: Department of Economic affairs
- **Encourage small grocery stores to setup shop in communities needing a grocery store**
 - Description: If residents can purchase their groceries without having to travel in a carbon fuel vehicle, they will emit less greenhouse gas emissions.
 - Proposed Actions: Identify neighborhoods that may be in need of a local grocery store and take steps to attract such businesses and entrepreneurs.
 - Goals: Local food supply, reduce GHG emissions
 - Time Frame: Mid-term
 - Department: Department of Economic affairs
- **Encourage service-based businesses on Main street rather than just tourist-based**

Description: Tourist-based stores are important to the downtown area and bringing money into our community; however, they must be balanced with a suitable number of service-based businesses for local residents. Preventing residents from having to travel out of Annapolis will keep money in the City and help to lower their carbon emissions related to travel.

Proposed Actions: Encourage service-based businesses on Main street rather than just tourist-based.

Goals: Improve local economy, reduce GHG emissions

Time Frame: Mid-term

Department: Department of Economic affairs

- **Community garden program**

Suggestion received from the public

Description: Providing local, community based sources of food will help to lower GHG emissions resulting from the transportation of food. In addition, public health may increase by promoting the consumption of vegetables rather than junk food. A community garden not only provides healthy, fresh produce and reduces GHG emissions from purchasing produce from supermarkets, but it also gives neighbors a sense of community when working together for a single, tangible cause.

Proposed Actions: Promote the creation of community gardens. Residents could either set aside community land for use by resident gardeners, or a community co-op system could be started where residents without garden space pay those who have it for a share of the vegetables they grow.

Goals: Lower GHG emissions, improved public health

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs, Recreation & Parks Department

- **Longer farmers' market hours and more markets**

Suggestion received from the public

Description: If the city had more farmers markets with longer hours, it would be easier for people to purchase local produce. With the inclusion of government programs and the use of food stamps and WIC vouchers, those with low-incomes can also eat healthy, local produce.

Proposed Actions: Work toward achieving more farmers markets in the city with longer hours.

Goals: localized economy, improved public health, lower GHG emissions due to less shipping

Timeframe: Short-term

Department: Office of the mayor

- **Create local food supply**

Suggestion received from the public

Description: Creating a local food supply can help to increase public health, decrease people's reliance on shipped produce, and improve public health.

Proposed Actions: Promote creation of community gardens in interested neighborhoods. Plant edible plants as city landscaping. Identify city right of ways that could be used for community gardens by the public. Update city code to allow residents to raise chickens, rabbits, and other livestock in the city.

Goals: Lower GHG emissions, improved public health

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Create a commercial port in Annapolis for appropriate local and regional goods**

Suggestion received from the public

Description: Having a commercial port in Annapolis would help to lesson the distance residents have to travel to purchase goods, it would support our local economy, and help to provide a back-up option if gas prices went high and lowered the amount of shipping via trucks. A local port in Annapolis should focus on local and regional goods that fit into the character of historic Annapolis.

Proposed Actions: Turn a part of City Dock into a commercial port that focuses on appropriate local and regional goods.

Goals: Fewer emissions from cross-country shipping, stronger local economy

Timeframe: Mid-term

Department: Public Works Department

Strategy B: Build local supply and demand for new green products and services, building our green economy

- **Renewable energy fair**

Description: Fairs and conferences bring like-minded people together to support a specific cause. If the event is held in a public place, passer-bys will take interest in the number of people gathering for an event.

Proposed Actions: Hold a fair with booths from local renewable energy companies, have a few speakers. Space at the new rec center could be utilized. Encourage people to walk, bike, or bus to the location.

Goals: Build local economy around renewables, promote adoption by local citizens

Costs: Local firms and businesses will likely participate for free

Timeframe: Mid-term

Department: Department of Economic Affairs

- **Encourage use of local biodegradable and recyclable goods by local businesses and residents**

Suggestion received from the public

Description: Getting people and businesses to buy local biodegradable and recyclable goods can help to improve our local economy and our environment.

Proposed Actions: Help to promote the use of local bio-degradable and recyclable goods.

Economy – Local Economic Development

Goals: Less waste, localized economy, reduced GHG emissions

Timeframe: Mid-term

Department: Department of Economic Affairs

Economy – Local Economic Development

GREEN JOBS

GOAL: THRIVING GREEN BUSINESS SECTOR THAT PROVIDES LOCAL EMPLOYMENT AND TRAINING FOR RESIDENTS

Strategy A: Increase number of green businesses in Annapolis

Action Items

- **Promote and attract green businesses and green industrial parks**

Proposed Actions: Encourage green businesses and industrial parks to create a location in Annapolis. Look into creating a green district or a green street.

Goals: Build a local green economy, educate citizens

Department: Department of Economic Affairs, Department of Neighborhood & Environmental Programs

Strategy B: Ensure residents have opportunities to be employed in the green business sector or to start their own green business

Action Items

- **Training needs assessment**

Description: As the City attracts more green businesses and seeks to develop the green businesses it does have, it will be important to give residents the training to be able to work for those businesses. A first step is to ensure that any training provided by the City or partner is what is needed by the existing or planned green businesses.

Proposed Actions: Conduct an assessment of current and planned green businesses in the City, and work with them to ensure that the skills being taught reflect their needs.

Goals: Grow the local economy, increase employment in green jobs

Timeframe: Short-term

Department: Office of Youth & Community Affairs

- **Green job/skill training program for youth and adults**

Description: Once the City knows what skills are needed by local green businesses, they can take the next step to create the training program.

Proposed Actions: Use the information from the training needs assessment to launch a green training program or partnership. One possibility is to work with Anne Arundel Community College to get such a program started.

Goals: Grow the local economy, increase employment in green jobs

Timeframe: Mid-term

Department: Office of Youth & Community Affairs

- **Green collar job fair**

Description: Work with the local green businesses, universities, and schools to host a green collar job fair to highlight such businesses, training, and employment opportunities for residents and students.

Proposed Actions: Host a green collar job fair at the new Rec Center or other large venue.

Goals: Grow the local economy, increase employment in green jobs

Timeframe: Mid-term

Department: Office of Youth & Community Affairs

- **Low cost home energy audits**

Suggestion received from the public

Proposed Actions: Utilize local students to perform home energy audits. Students have performed energy audits for school buildings and are interested in working with the city on some projects as a part of their class.

Goals: Lower GHG emissions, increased residential energy efficiency

Timeframe: Mid-term

Department: Office of the mayor

Strategy D: Educate tourists about sustainability

Action items

- **Sustainable tourism project**

Description: A large number of tourists visit Annapolis every day. Lowering the impact they have on our environment and climate can provide many benefits to the city.

Proposed Actions: Create brochures, signs, and other methods of educating tourists about our green activities and our Sustainable Annapolis efforts. Create information that includes ways that they can lower their carbon footprint while visiting our city, such as promoting the walkability of Annapolis and taking measures to lower tourist reliance on their automobiles.

Goals: Lower GHG emissions from tourists, education

Timeframe: Mid-term

Department: Department of Economic Affairs, Public Information Office

- **Promote growth of eco-tourism in the City**

Description: Eco-tourism is environmentally responsible tourism. This can range from “green” housing for tourists, to “green” side trips, such as a trip on the Chesapeake Bay.

Proposed Actions: Create an eco-tourism program to attract such businesses and to get existing tourist activities converted to eco-tourism. This could fall under the Sustainable Annapolis Environmental Stewardship program.

Goals: Lower GHG emissions from tourists, education, growth of local economy

Timeframe: Mid-term

Department: Department of Economic Affairs,

- **Downtown Sustainable Annapolis kiosk**

Suggestion received from the public

Proposed Actions: Install a kiosk at city dock educating citizens about how Annapolis is a green, sustainable city.

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

NEIGHBORHOODS



CHILDREN, HEALTH, & SAFETY

GOAL: IMPROVE PUBLIC HEALTH

Strategy A: Target environmental health hazards

Action items

- **Program to replace/rehabilitate lead-threat windows**

Description: Replacing single-pane windows can save \$126-\$465 a year, replacing double-pane clear glass can save \$27-\$111 a year.

Getting lead out of houses will improve public health. In the historic district windows can be rehabilitated to remove any existing lead and improve their energy efficiency. The removal of historic fabric should not be encouraged, since it would contribute to the landfill. Pre-WWII wooden materials are more durable than most wood in replacement windows today.

Proposed Actions: Trade-in program, lead-threat windows for energy star windows. Include rehabilitation of historic windows and installation of storm windows to increase energy efficiency.

Goals: Improve public health and energy efficiency

Timeframe: Mid-term

Cost: \$330 (low end) per window

Grant possibilities (lead paint grant funding- \$100,000)

Department: Department of Neighborhood & Environmental Programs, Historic Preservation Office-Planning & Zoning, Mayor's office

- **Lessen noise pollution**

Suggestion received from the public

Description: Noise pollution can lead to chronic health problems in the public. Health problems include: stress-related illnesses, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity.

Proposed Actions: Take steps to lower the noise pollution resulting from traffic and construction. Restrict the hours construction can take place in residential neighborhoods in the city. Plant trees and take other steps to limit the amount of noise pollution coming off of roads.

Goals: Less noise pollution, improved public health

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Reduce mosquito breeding**

Suggestion received from the public

Description: A high number of mosquitoes can negatively impact public health. Measures that can help to reduce mosquito breeding include installing more bat boxes throughout the City and encouraging insectivorous birds.

Proposed Actions: Perform a study of the impact mosquitoes in Annapolis have on public health. Determine the suitability and impact of using mosquito donuts and installing bat boxes throughout the city.

Goals: Less noise pollution, improved public health

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

Strategy B: Greater access to healthy foods

Action items

- **Community wellness**

Work is currently progressing on this by Rec & Parks

Description: Getting people active with Rec & Parks programs and eating local will improve community wellness and help prevent chronic illnesses.

Proposed Actions: Create a program to promote community wellness.

Goals: Improved public health

Timeframe: Mid-term

Department: Recreation & Parks Department

- **Heart-smart program for local restaurants**

Description: A heart smart logo can be used to label food items on local menus that are healthy choices for people.

Proposed Actions: Create a heart-smart program with a recognizable logo that participants can use on their menus.

Goals: Improved public health

Timeframe: Mid-term

Department: Recreation & Parks Department

Neighborhoods – Children, Health, & Safety

- **Zoning update to allow for sale of local produce in neighborhood stores**

Description: Many of the smaller grocery stores, quick marts, corner stores, and other community stores do not offer much in the way of healthy foods, and may be prevented from selling local produce due to current zoning restrictions. A program should be developed to link local farmers with these local stores, and to promote the creation of a healthy food aisle in the stores. Zoning may have to be updated to allow for this.

Proposed Actions: Create a healthy food program for local stores and update zoning as needed.

Goals: Improved public health

Timeframe: Mid-term

Department: Recreation & Parks Department

- **Food drop-off program for local shelters**

Description: With 12.7% of Annapolis residents living below the poverty level (U.S. 2000 Census), there is a need for government and community aid to reach those individuals and families. Making food readily available to those in need improves public health and the health of the overall neighborhood.

Proposed Actions: Create a food drop-off program for local shelters so that food will be easily available for individuals at or below poverty level.

Goals: Prosperous and healthy community

Time Frame: Short/Mid-term

Cost: outreach materials

- **Community Gardens**

Suggestion received from the public

Description: Providing local, community based sources of food will help to lower GHG emissions resulting from the transportation of food. In addition, public health may increase by promoting the consumption of vegetables rather than junk food. A community garden not only provides healthy, fresh produce and reduces GHG emissions from purchasing produce from supermarkets, but it also gives neighbors a sense of community when working together for a single, tangible cause.

Proposed Actions: Promote the creation of community gardens. Residents could either set aside community land for use by resident gardeners, or a community co-op system could be started where residents without garden space pay those who have it for a share of the vegetables they grow.

Goals: Lower GHG emissions, improved public health

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs, Recreation & Parks Department

GOAL: IMPROVE PUBLIC SAFETY

Strategy A: Crime prevention

Action items

- **Paper shredding events**

Suggestion received from the public

Description: Identity theft has been a problem for many years. With a paper shredding event, those papers that would have been in the trash or recycling bins would not be taken by identity thieves.

Proposed Actions: Host or coordinate an annual paper shredding event where people can shred their sensitive mail and papers and then have it recycled.

Goals: Less identity theft, increased recycled paper material

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Utilize environmental design to lessen crime**

Description: Environmental design has been utilized in communities to lessen crime. Methods include natural surveillance (visibility), territorial reinforcement (physical deterrents), natural access control, and target hardening.

Proposed Actions: Educate a staff member to provide these services to communities.

Goals: Increased public safety

Timeframe: Mid-term

Department: Police Department

- **Create a “Sky Glow” program in key areas to increase night-time visibility while being dark skies compliant**

Description: Ineffective lighting creates nuisances and safety hazards for the community, drivers, and aviators. Reduce glare by positioning adjustable lights downward, reduce spillover by installing fully shielded lights, and reduce sky glow by installing fixtures that have the light bulb tucked into the luminaire housing. Taking these actions keeps the light shining only on their intended areas, reducing wasted energy

Proposed Actions: Create a program that educates businesses about proper lighting.

Goals: increased public safety, reduced wildlife disorientation

Timeframe: mid-term

Department: Police Department, DNEP

Neighborhoods – Children, Health, Safety

EDUCATION, ARTS, & COMMUNITY

GOAL: EDUCATE PUBLIC ON IMPORTANCE OF THE ENVIRONMENT AND SUSTAINABILITY

Strategy A: Greater public participation in environmental and sustainability events/programs

Action items

- **Citizen sustainability awards**

A similar program is already being implemented by DNEP through the Environmental Stewardship program

Proposed Actions: Add Sustainable Annapolis citizen and business awards the existing award system used by the mayor.

Goals: increased public participation, lower GHG emissions

Timeframe: Short-term

Department: Office of the mayor, Department of Neighborhood & Environmental Programs (DNEP)

- **Sustainable Annapolis promotion**

Proposed Actions: Turn the few months before the unveiling of the annual Sustainable Annapolis Report Card into a larger series of speakers, events, and workshops on sustainability.

Goals: Greater public participation, education, lower GHG emissions

Timeframe: Short-term

Department: Department of Neighborhood & Environmental Programs

Strategy B: Sustainable communities

Action items

- **Technical support for communities going green/sustainable**

Proposed Actions: Provide support to community associations and other residents who want to know how they can become more sustainable and how they can lower their carbon footprint. The Sustainable Annapolis website could be utilized for this purpose.

Goals: Greater public participation, more sustainable neighborhoods, lower city GHG emissions

Timeframe: Mid-term

Department: Department of Neighborhood & Environmental Programs

- **Promote behavior changes in the public**

Suggestion received from the public

Description: Public behavior can be changed to become more sustainable

Proposed Actions: Take steps to educate the public about how they can lead more sustainable lives, as it relates to specific department focus areas.

Goals: Lower GHG emissions, cleaner air, cleaner water quality, greater public education

Departments: All

Strategy C: Educate residents about sustainability

Action items

- **Sustainable Annapolis cable show**

Proposed Actions: Create a Sustainable Annapolis show that will help to educate citizens about efforts they can take to become more sustainable. Ideas range from highlighting energy efficiency improvements to education on climate change. Local businesses, citizens, or city representatives could be invited to participate.

Goals: Greater energy efficiency, improved public education on sustainability issues & climate change, lower city GHG emissions

Timeframe: Short-term

Department: Public Information Office, Department of Neighborhood & Environmental Programs

- **Heritage Community wildlife area for education**

Suggestion received from the public

Description: Some residents in the Heritage Community are interested in offering the city the opportunity to use some of the open space in their community. The open space could be used for educational purposes.

Proposed Actions: If possible, utilize the Heritage Community property for wildlife and other environmental education opportunities. Contact Richard Fraenkel, Board member with the Heritage Pool & Community Association, for more information (410-263-7273).

Goals: Public education, recreational opportunities

Neighborhoods – Children, Health, Safety

Timeframe: Mid-term
Department: Recreation & Parks Department

Strategy E: Educate youth about sustainability

Action items

- **Sustainability in the school curriculum**

Description: The schools in the City are operated under the county school board. The City should work with the school board to get sustainability issues included in the curriculum. Sustainability issues could include climate change, water conservation, energy conservation, and waste management.

Proposed Actions: Work to get sustainability in the county school curriculum

Timeframe: Mid-term

Department: Office of the Mayor

- **Sustainability community service program**

Description: Help to educate youth through getting them involved with sustainability-related community service. Organizations offering such opportunities could include community centers, schools, churches, yacht clubs, and other community based organizations.

Proposed Actions: Start a sustainability community service program.

Timeframe: Mid-term

Departments: Office of the Mayor, Youth and Community Affairs

- **Partnership with youth groups**

Description: Many of the area schools and churches may have youth environmental clubs that are already working on sustainability projects. Creating an alliance or partnership between such organizations could be utilized to reach even more youth.

Proposed Actions: Create a partnership between area youth groups to help educate and reach more young adults

Timeframe: Mid-term

Goals: Citizen outreach, create the next generation of globally-minded individuals

Departments: Office of the Mayor, Youth and Community Affairs

- **Re-launch Cloud 9 program**

Proposed Actions: Re-launch the Cloud 9 program for Annapolis-area schools and residents.

Goals: Cleaner air, lower GHG emissions, increased public participation

Timeframe: Short-term

Cost: New materials - \$7,500

Department: Department of Neighborhood & Environmental Programs

Strategy F: Help the public experience our environment

Action items

- **No child left inside program**

Work is currently progressing on this by Rec & Parks

Description: The Federal No Child Left Inside act promotes environmental education and outdoor education opportunities for children. This will help to increase their appreciation for the bay and their local environment.

Proposed Actions: Create a program to take advantage of the No Child Left Behind opportunities and grants.

Goals: Improved public health, cleaner bay

Timeframe: Mid-term

Department: Recreation & Parks Department

- **Increase public water access by reclaiming dead-end street right of ways to water**

Suggestion received from the public

Description: When people have greater access to enjoy the bay, they will care more about restoring it.

Proposed Actions: Search for dead end streets that are city right-of-ways that can be converted to give access to the water for the public.

Goals: Improve public health and bay health

Timeframe: Short-term

Departments: Harbor Master's Office, Planning & Zoning Department, Recreation & Parks Department, Department of Neighborhood & Environmental Programs, Public Works Department